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## Joma Snowplow Blade Life Span: A Survey of State Experience

*The purpose of this TRS is to serve as a synthesis of pertinent completed research to be used for further study and evaluation by MnDOT. This TRS does not represent the conclusions of either CTC & Associates or MnDOT.*

### **Introduction**

Joma plow blades are a relatively new option for winter maintenance. They consist of carbide inserts brazed into steel segments that are encased in rubber, which the manufacturer claims will offer a longer life span in addition to other benefits. They are widely used in winter maintenance operations in Minnesota.



Recently, however, MnDOT has noticed premature wearing on new Joma blades relative to blades purchased a few years ago. The agency was interested in determining if other states shared this experience as well as investigating the possibility that microsurfacing treatments on pavements may be contributing to this reduced life span.

We gathered information for this report through a literature review and an online survey of both Clear Roads winter maintenance pooled fund members and MnDOT districts. Survey questions focused on the impact of pavement type and microsurfacing on Joma blade life as well as whether blade life spans have changed in the past two years.

### **Summary of Findings**

#### **Literature Review**

Limited research has been published regarding the wear performance of Joma blades. The formal research and less formal tests that are publically available almost universally agree that Joma blades have significantly longer life spans than other types of plow blades. However, a few sources do refer to issues that may reduce Joma blade

life span, including improper installation, use on roads that are in poor condition or use on recently chip sealed roads.

### **Survey of Current Practice**

We received 92 responses to the online and emailed survey. Joma blade usage is common among all respondents and universal among the Minnesota respondents. Most survey respondents reported Joma blade life spans between one and three years. Minnesota's respondents were significantly more likely to report shorter Joma blade life spans (one year or less), although that does not necessarily mean that the life span of Joma blades is less than carbide plow blades.

Some, but fewer than half, of respondents reported an impact from pavement type on Joma blade life span. While a few reported that concrete wears Joma blades faster than asphalt does, most of these respondents said the age of the pavement was a more important factor. According to these respondents, new pavements cause more wear than pavements that are a few years old. In addition, they generally agreed that this would affect all types of blades rather than just Joma blades. Roughly half of the respondents who use microsurfacing treatments of some sort said that those treatments reduce Joma blade life. Many respondents said this problem is most pronounced when the microsurfacing is new as well.

Opinions differed significantly about whether Joma blade life spans have decreased in the past two years. Almost none of the Clear Roads respondents have noticed any change in blade life span, while nearly half of respondents from Minnesota have. While none of the respondents have completed any formal investigations into what caused the shortened life spans, several did offer potential explanations for this phenomenon, including improper installation, dryer snowfalls that cause more wear to blades than wetter storms, poor blade quality, a new concrete road surface that wears blades faster and the use of Joma blades on underbodies that cause more wear.

### **Literature Review**

Limited research has been published about the life span and wear performance of Joma blades, although many jurisdictions have conducted tests and reported the results in less formal ways. These reports almost universally state that Joma blades last significantly longer than other types of plow blades.

### **Conditions That Impact Joma Blade Life Span**

A few sources did make references to issues that may reduce Joma blade life spans. These references are isolated, anecdotal and often based on conjecture rather than research, so they cannot be accepted as definitive causes of premature Joma blade wearing. However, they may offer clues as to causes that warrant further investigation.

North Dakota's [test](#) of Joma blades (and other snowplow blade types) in the 2010-2011 winter season found that Joma blades lasted three to four times longer than carbide steel. However, three blade segments, all on the same truck, did need to be replaced during the season. The driver reported that the angle of these blade segments was not initially set correctly, which caused the premature wear.

Clear Roads' Product Experience Feedback [report](#), which collects user comments about a variety of winter maintenance products and equipment, included one partially critical comment about the Joma blade life span. Minnesota reported generally favorable experiences with the Joma blade life span in the 2007-2008 winter season, rating its durability as 5 out of 5 (excellent), but it did note that "The Elk River truck 99045 on the TP3NR512 (T.H.10 W.) route had quite different results of 40 hr. before replacement. The biggest difference they had was 45 miles of very poor concrete with many poor cross cracks and potholes. Another possible problem could be plowing habits and excessive speed, which are hard to record."

Finally, a [reference](#) to a Utah DOT study declared that while the use of Joma blades has reduced the number of blade changes needed per truck, some anecdotal reports suggest that the blades do not work well on roads that have been chip sealed recently, and that the blades causes plow springs to dump more frequently. However, the

currency and even ownership of the site where this reference was found cannot be confirmed, and the Utah DOT library could not confirm the study, so its comments should be viewed with due skepticism.

These comments, however, are the exception rather than the rule. Published sources report Joma blades typically had three to eight times the life span of other types. These references are summarized in the table below.

**Published Reports of Joma Blade Life Span**

| Source   | Year | Type             | Jurisdiction                    | Findings  |
|--|------|------------------|---------------------------------|---|
| <a href="#">Evaluation of Snow Plow Blade Systems, Final Evaluation</a>              | 2011 | Research report  | North Dakota DOT                | Joma blades lasted three to four times longer than carbide steel, although in the test one truck experienced a reduction in Joma blade service life when the blade angle was set incorrectly on the plow.   |
| “ <a href="#">Maintenance testing new blades.</a> ” <i>Inside</i> newsletter         | 2009 | Anecdotal report | Iowa DOT                        | Blades tested in 2000 lasted an average of three times longer than steel blades, although Iowa didn’t implement them at the time due to cost.   |
| <a href="#">Joma Plow Blade Evaluation</a>   | 2010 | Research report  | Lake County, Ohio               | Joma blade life span averaged 6,000 miles since they were first installed on the county’s plows in 2005 compared to 1,000 to 1,500 miles for steel blades.  |
|  | 2010 | Research report  | Franklin County, Ohio           | Trucks equipped with steel blades required an average of 2.6 blade changes in the 2006-2007 winter season. During the 2007-2008 winter season, trucks equipped with Joma blades required an average of 0.5 blade changes, suggesting five times as many blade changes for steel blades as Joma blades, although service time and mileage were not reported.   |
| <a href="#">New Hampshire DOT 2009 Annual Report</a>                                 | 2009 | Anecdotal report | New Hampshire DOT               | Projecting from five months of testing from the winter of 2008-2009, New Hampshire’s District 6 determined that Joma blades would last eight times as long as the department’s current blades. Further testing was planned for the 2009-2010 winter, but it did not happen due to the mildness of that winter.  |
| <a href="#">Clear Roads Product Experience Feedback for 2006-2013 Winter Seasons</a> | 2009 | Anecdotal report | Illinois DOT                    | One Joma blade outlasted two sets of carbide blades in a single test. Follow-up comments in 2011 and 2012 reported that increased life span had continued.  |
|  | 2008 | Anecdotal report | Milaca and Elk River, Minnesota | On one route, consisting of 14 miles of seal coat, 10 miles of microsurfacing, 5 miles of nova chip and 5 miles of bituminous, a Joma blade lasted 108 hours before replacement. A second route, consisting of 18 miles of seal coat, 25 miles of bituminous, 7 miles of concrete and 9 miles of microsurfacing, a Joma blade lasted 85.5 hours. On a third route, which was 45 miles of concrete in poor condition, a Joma blade lasted only 40 hours. |
|  | 2007 | Anecdotal report | Utah DOT                        | In two tests, Joma blades lasted 124 hours and 108 hours compared to an average of 21 hours for traditional blades.   |

## **Recent Developments in the Carbide Industry**

We investigated reports from several other industries that use carbide to determine if any other carbide-using industries have detected recent changes in quality. These investigations were not fruitful. Jennifer Boyle of the United States Cutting Tool Institute said that the Institute was not aware of any industrywide issues. Searches of the websites for several trade magazines similarly found little evidence to suggest carbide supply issues. The sites surveyed include Woodworking Network (a group of three wood furniture and cabinet-making trade magazines, [woodworkingnetwork.com](http://woodworkingnetwork.com)); *Fabricating and Metalworking* ([fabricatingandmetalworking.com](http://fabricatingandmetalworking.com)); *Cutting Tool Engineering* ([ctemag.com](http://ctemag.com)); and *Production Machining* ([productionmachining.com](http://productionmachining.com)).

An article in *Production Machining* did note a fivefold increase in tungsten carbide costs and a resulting 60 to 70 percent increase in the cost of solid carbide tooling in 2004. However, that story is of minimal value to this investigation as it provides no details about the reason for the increased costs and it significantly predates the issues with blade life span currently experienced by MnDOT.

## **Survey of Current Practice**

We created a brief online survey about Joma blade life spans that was distributed to two groups: MnDOT district offices and Clear Roads members. We received 55 responses from MnDOT and district staff, and 37 responses representing 17 states from the Clear Roads group. Most states—13 of the 17—had only one respondent. As a result, the four states with multiple respondents (Colorado, Idaho, Oregon and Wisconsin) could be viewed as being overrepresented in the survey. In practice, this is a minimal factor in the information provided, because we are looking to identify potential explanations for reduced Joma blade life span rather than attempting to calculate average life spans. However, throughout this summary, we either list the number of jurisdictions who give each response and the number of representatives from those jurisdictions who give each response, or else provided detailed notes by respondent, as appropriate. While most Clear Roads respondents represent the state DOT, the five respondents from Wisconsin each represent county highway departments.

The survey consisted of the following questions:

1. Does your agency use Joma blades for snow plowing
2. What portion of the snowblades you use are Joma blades?
3. What is the typical life span you expect from the Joma blades you use?
4. Have you seen any effect from pavement type (i.e., concrete vs. asphalt) on Joma blade life span? If so, please describe.
5. Do you use any form of microsurfacing treatment on your pavements? If so, please describe.
6. If you do use any form of microsurfacing treatment, has it had any impact on typical Joma blade life span?
7. Have you noticed any changes in Joma blade life span in blades you have purchased in the last two years?
8. If you have seen any changes in Joma blade life spans in the past two years, have you conducted any testing, analysis or other investigation to determine what may be the cause? Please describe.

Findings are summarized below by question. See **Survey Results** beginning on page 13 for the full text of all survey responses.

**Question 1: Use of Joma Blades**

A significant majority of respondents said their agency uses Joma blades: all 55 MnDOT respondents and 30 out of 37 Clear Roads members. Several of the Clear Roads states had multiple respondents to the survey. Among the non-MnDOT Clear Roads respondents, Joma blades are in use in a majority of states—12 out of 17.

| <b>Use of Joma blades</b>      |                                  |  |
|--------------------------------|----------------------------------|--|
| <b>Agency Uses Joma Blades</b> | <b>Number of Respondents</b>     | <b>Agencies</b>  |
| Yes                            | Clear Roads: 30<br><br>MnDOT: 55 | Colorado DOT (6 respondents); Idaho Transportation Department (5 respondents); Iowa DOT; Michigan DOT; Missouri DOT; North Dakota DOT; Oregon DOT (7 respondents); Pennsylvania DOT; Utah DOT; West Virginia Division of Highways; Wisconsin county highway departments: Crawford, Dodge, Marquette and Waukesha counties; Wyoming DOT |
| No                             | Clear Roads: 7                   | Colorado DOT Section 5, Kansas DOT, Massachusetts DOT, Montana DOT, New York State DOT, Rhode Island DOT, Wisconsin: Barron County Highway Department  |

**Question 2: Joma Blade Percentage**

While many of the agencies use Joma blades, they don't necessarily use them exclusively. In fact, almost half of Clear Roads respondents (representing eight of the 17 responding states) use Joma blades less than 25 percent of the time. This may suggest that several states are still testing the use of Joma blades. (Respondents from Wyoming DOT and Crawford County, Wisconsin, outright declared that they were testing the Joma blade, and one of the respondents from Idaho strongly suggested that testing was still taking place.)

While eight Clear Roads respondents said their state uses Joma blades exclusively or almost exclusively, all but three represent a single agency, Oregon DOT.

In Minnesota, the usage of Joma blades appears to be quite a bit more extensive. Nearly half of respondents said that 75 percent to 100 percent of their blades are Joma blades, and almost none reported using Joma blades less than 25 percent of the time.

| Percentage share of Joma blades |                             |   |
|---------------------------------|-----------------------------|---|
| Percentage of Joma Blades       | Number of Respondents       | Agencies  |
| 0%-25%                          | Clear Roads: 15<br>MnDOT: 3 | Colorado DOT (2 respondents); Idaho Transportation Department (5 respondents); Missouri DOT; North Dakota DOT; Oregon DOT (1 respondent); West Virginia Division of Highways; Wisconsin county highway departments: Crawford, Dodge and Marquette counties; Wyoming DOT |
| 25%-50%                         | Clear Roads: 4<br>MnDOT: 18 | Colorado DOT (1 respondent); Michigan DOT; Oregon DOT (1 respondent); Pennsylvania DOT  |
| 50%-75%                         | Clear Roads: 3<br>MnDOT: 9  | Colorado DOT (2 respondents); Utah DOT  |
| 75%-100%                        | Clear Roads: 8<br>MnDOT: 25 | Colorado DOT (1 respondent); Iowa DOT; Oregon DOT (5 respondents); Wisconsin: Waukesha County Department of Public Works/Highway Operations   |

### **Question 3: Typical Joma Blade Life Span**

We received a range of answers about Joma blade life span, even from respondents within the same state. The most commonly reported life span was one to three winters, although many noted that conditions in any given winter can have a significant impact on blade life span. Minnesota respondents were somewhat more likely to report shorter life spans than other Clear Roads members. Two-thirds of the Clear Roads respondents who described Joma blade life spans in years or seasons reported that the Joma blades typically last at least two years. Almost three-fourths of MnDOT respondents, however, said their Joma blades typically last one year or less.

These relatively short life spans do not necessarily indicate that Joma blades have poor life spans relative to carbide. MnDOT's Jill Grindle said that Joma blades last almost one season, but that life span is two to three times that of steel carbide. This sentiment was echoed by Mark Eike of Colorado DOT.

Many respondents reported blade life spans in other terms, most commonly a direct comparison of Joma blade life to carbide blades. Respondents who reported blade life in these terms said that Joma blades last an average of two to three times as long as carbide.

Several respondents noted factors that can impact blade life, including weather, road surface, plow type and operator error. While these respondents represent a fairly small portion of the total number of survey respondents, the factors may be worth investigating as potential causes of reduced life span that MnDOT has experienced. A selection of notable responses is given below:

- Paul Howland, Oregon DOT: Either heavy slush or particularly light snowfalls can cut Joma blade life span in half.
- Mike Hagen, Iowa DOT: Life span depends on surface type and weight of plow. We have had a lot of light snows, so we are plowing on dry roads at times.
- Rich Lani, Oregon DOT: We put on new sets in 2011 and hadn't changed them yet through the winter of 2013 because of wear—only damage done by the operator.
- Bruce Schlueter, MnDOT: Joma blade life span is normally two to three times that of steel with carbide, but it depends on the type of snowstorms, the type of plow they are on and the type of road surface.

- Shawn King, MnDOT DL Maintenance: Last year it seems they lasted longer than the Joma blades this year. We could get a full year out of the early ones.

Full responses to this question are detailed below. Respondents reported blade life span in a variety of ways, including number of seasons, number of service hours, number of miles plowed and life span relative to carbide blades. As the responses did not always fit neatly into categories, notes in the table describe the responses more thoroughly. In a few instances, respondents described Joma blade life span in more than one way; in those situations, the respondent appears in the table multiple times. MnDOT respondents are identified by their specific district or division when that information was entered on the survey form; when no organization is specifically identified, the respondent gave their organization as simply “MnDOT.”

| <b>Joma blade life span</b> |                              |                                 |   |
|-----------------------------|------------------------------|---------------------------------|---|
| <b>Life Span Units</b>      | <b>Approximate Life Span</b> | <b>Number of Respondents</b>    | <b>Respondents, Agencies and Notes</b>  |
| Number of seasons           | Less than 1 season           | Clear Roads: 1<br><br>MnDOT: 10 | <b>Mark Eike</b> , Colorado DOT: Two changes per snow season, about three times the life span of a carbide blade.<br><br><b>Larry Capaul</b> : 1/3-1/2 of a typical winter. <b>Jill Grindle</b> : Almost a full winter season, and about 2-3 times longer than steel carbide. <b>Shawn King</b> , DL Maintenance: Previously 1 year, but this year life span has been reduced. <b>Hugh Miller</b> : 1-2 sets per year. <b>Jed Mulder</b> , District 3B Lake Area: 1.5 sets per year per truck. <b>Tim Murphy</b> : 3/4 of a year, depending on snowfall. <b>Kyle Nelson</b> , MnDOT Maintenance: 2 months with less snow to 3+ months with more snow. <b>Wally Rosier</b> , MnDOT Metro: 2-3 months. <b>Anonymous #1</b> : 3 months. <b>Anonymous #3</b> : Months to a year, depending on circumstances.  |
|                             | 1 season                     | Clear Roads: 6<br><br>MnDOT: 15 | <b>Aaron Auer</b> , North Dakota DOT: 1-2 years. <b>Robin Berheim</b> , Oregon DOT: 1 season. <b>Pete Chladil</b> , Waukesha County (Wis.): At least 1 winter, sometimes more. <b>Paul Howland</b> , Oregon DOT: 1 season under normal snow conditions, but heavy slush or particularly light snowfalls can cut life span by half. <b>Rodney Richards</b> , Colorado DOT: 1 winter; <b>W. James Smith</b> , Pennsylvania DOT: 1-2 seasons.<br><br><b>Gregory Boben</b> , MnDOT Virginia: 1 change per year. <b>Ryan Callen</b> : About 1 year, maybe a little longer. <b>Jeff Graves</b> : 1 season. <b>Kevin Hoge</b> : 1 season. <b>Steven Holste</b> : 1 season. <b>Gary Kennedy</b> , MnDOT District 2: 1 season but we have gotten up to 2 seasons. <b>Mike Kiley</b> , St. Cloud Maintenance: 1 season in the average year. <b>Greg Laine</b> : 1 year. <b>Don Mehren</b> , MnDOT Maintenance: 1 season. <b>Allen Milbradt</b> : 1 full winter season. <b>Jacob Mortvedt</b> , MnDOT District 2 Roseau: 1 season for front plows, but 1/3 season for underbody plows. <b>David Redig</b> : 1-2 seasons, depending on road surface. <b>Robert Solomon</b> : 1 winter season. <b>Dan Whebbe</b> , District 3B Elk River: 1 season. <b>Brian Wolfgram</b> , MnDOT District 6: 1 normal winter season, 3 times as long as other blades. |
|                             | 2 seasons                    | Clear Roads: 6                  | <b>Greg A. Adams</b> , Oregon DOT: 2 seasons. <b>Tim Chojnacki</b> , Missouri DOT: 2-3 seasons. <b>Randy L. Franks</b> , Dodge County (Wis.): 2 seasons. <b>Shawn King</b> , Oregon DOT: 2-3 normal winters. <b>Richard Peryer</b> , Idaho Transportation Department: 2 seasons. <b>D.J. Price</b> , Idaho Transportation Department: Usually 2 seasons, but it depends on weather.   |

|                                      |                          |                                 |  |
|--------------------------------------|--------------------------|---------------------------------|--|
|                                      |                          | MnDOT: 5                        | <b>Kim Bergstrom</b> , MnDOT Maintenance (Floodwood): 1-1/2-2 years. <b>Don Nobisch</b> , MnDOT Austin Sub-Area Maintenance: 2-3 years. <b>Wes Smith</b> , MnDOT District 6: 2 seasons. <b>Dean Weber</b> , MnDOT Hastings Truck Station: 2-3 years. <b>Tim Zierden</b> : 2-3 seasons.   |
|                                      | 3 seasons                | Clear Roads: 2<br><br>MnDOT: 2  | <b>Travis Dodd</b> , Idaho Transportation Department: A blade that has been in operation for 3 seasons still looks good. <b>Rich Lani</b> , Oregon DOT: Blades installed in 2011 have not yet been changed due to wear.<br><br><b>Curt Larson</b> : We hope to get close to 3 seasons use on our plows. <b>Stephen Hufnagle</b> : 3 years.   |
|                                      | More than 3 seasons      | Clear Roads: 3<br><br>MnDOT: 2  | <b>Joe Arnold</b> , Oregon DOT: 4 seasons. <b>Rod Hauenstein</b> , Michigan DOT: Several units have nearly 4 winters on them. <b>Del Webb</b> , Oregon DOT: 7+ years.<br><br><b>Jonathan Amos</b> : 3-4 years, depending on weather. <b>Steve Eastman</b> , MnDOT District 6 Rochester: 4 seasons.   |
| Number of service hours              | Up to 100 hours          | Clear Roads: 1                  | <b>Lynn Bernhard</b> , Utah DOT: 60 hours.   |
|                                      | More than 100 hours      | Clear Roads: 1                  | <b>Clifford E. Spoonemore</b> , Wyoming DOT: Testing is underway; one set lasted for 224.5 hours.  |
| Number of miles plowed               | Up to 5,000 miles        | Clear Roads: 2<br><br>MnDOT: 1  | <b>Mark Gocha</b> , Colorado DOT: 3,000-3,500 miles this year, but it was 4,000-4,500 miles on asphalt in previous years. <b>Dawn Walker</b> , Colorado DOT: 3,000-5,000 miles.<br><br><b>Anonymous #2</b> : Approximately 5,000 miles, although it wears faster on bare pavements.  |
|                                      | More than 5,000 miles    | Clear Roads: 1<br><br>MnDOT: 1  | <b>Bradley Lynch</b> , Idaho Transportation Department: 6,000-7,000 miles.<br><br><b>Dan Meinen</b> : Approximately 7,000 lane-miles or 15 winter events.  |
| Life span relative to carbide blades | Up to double carbide     | Clear Roads: 1<br><br>MnDOT: 4  | <b>Ed Gentry</b> , Colorado DOT: Half the life span of double carbide blades, maybe less.<br><br><b>Ryan Callen</b> : Same as metal cutting edges, about one year or maybe a little longer. <b>Chris Cheney</b> , MnDOT District 1, Border Sub-Area: Most of our routes have older, rougher bituminous surfaces that wear out Joma blades as quickly as regular carbides. Centerline rumble strips wear out the Jomas much faster than regular carbides. Jomas wear better on newly paved surfaces. <b>Darrick Rust</b> , MnDOT District 4, Morris TS: Twice as long as carbide. <b>Brad Vance</b> , MnDOT Monticello Truck Station TG: Maybe two times of normal carbide.   |
|                                      | More than double carbide | Clear Roads: 2<br><br>MnDOT: 11 | <b>Steven Engelbert</b> , Idaho Transportation Department: Up to 6 times life span of carbide; <b>Jeff Pifer</b> , West Virginia Division of Highways: 3 times life span of carbide.<br><br><b>Mike Beckermann</b> : 3 times carbide. <b>Randy Glaser</b> , MnDOT Mankato: 3 times the length of normal carbide. <b>Jill Grindle</b> : 2-3 times longer than steel carbides, almost a full winter season. <b>John Hodena</b> , MnDOT District 1: 2-3 times longer than old blades. <b>Joel Kroening</b> , 2-3 times the life of carbide. <b>Randy Potts</b> : 3 times standard carbides. <b>Bruce Schlueter</b> : Normally 2-3 times that of steel with carbide, but it depends on the types of storms, plows and road surface they are mounted on. <b>Randy Strassburg</b> , MnDOT Little Falls Sub-Area: 2-3 times that of carbide. <b>Clint Van Vickie</b> , 3-4 times the life span of steel |



|       |  |                                |   |
|-------|--|--------------------------------|---|
|       |  |                                | carbide. We installed a set of Joma blades and steel carbide blades on the underbodies of two trucks on the same day in December 2013. The steel carbides wore out the week of 1/21/14, while the Joma blades still had 85% of their life left. <b>Brian Wolfgram</b> , MnDOT District 6: 1 normal winter season, 3 times as long as other blades. <b>Anonymous #4</b> : 3 times longer than a regular blade. |
| Other |  | Clear Roads: 4<br><br>MnDOT: 2 | <b>Mike Hagen</b> , Iowa DOT: Depends on surface type, weight of plow and weather. <b>Byron Henke</b> , Marquette County (Wis.): Depends on weather. <b>Todd Myers</b> , Crawford County (Wis.): Just started testing. <b>Roger Swiger</b> , Colorado DOT: 5-8 storms.<br><br><b>Rich Nadeau</b> : 3-4 good storms. <b>Paul Traxler</b> , MnDOT Jordan Truck Station: 3-4 good storms.                        |

#### **Question 4: Impact of Pavement Type**

The majority of respondents have seen no impact on Joma blade life span due to pavement type. Nine out of 30 respondents, representing eight states, did report noticing an effect from pavement type in their jurisdiction, as did 19 out of 52 MnDOT respondents. There are several factors that should be considered in viewing these results, however. Most of the respondents who had noted that pavement type affected Joma blade life span stated that it was the freshness of a pavement that affected a blade's life span rather than the type. Respondents also generally agreed that pavement type would affect all types of plow blades, not just Joma blades. Several respondents also cited the impact of microsurfacing in this question, when we intended to limit this question to pavement type and address microsurfacing in questions 5 and 6.

Keeping those factors in mind, relatively few responses can accurately be viewed as implying that one type of pavement wears Joma blades more quickly than another, or that Joma blades are more affected by one type of pavement than other types of blades. However, several individual responses offer useful insights for this research:

- **Robin Berheim**, Oregon DOT: Concrete appears to wear blades faster than asphalt, although it's difficult to be certain because plows run on concrete, asphalt and chip seals in the course of a shift. **Randy Franks** of Dodge County, Wisconsin, also said that Joma blades have shorter life spans on concrete.
- **Aaron Auer**, North Dakota DOT: New asphalt, concrete or microsurfacing wears Joma blades more quickly, although any type of blade would experience a similarly shortened life span.
- **Dawn Walker**, Colorado DOT: Both new concrete and the pitch of the plow blade can impact Joma blade life span.
- **Mike Hagen**, Iowa DOT: Concrete causes the least wear to Joma blades. Older asphalt is less wearing than new asphalt, and microsurface is bad for Joma blade life span.
- **Roger Swiger**, Colorado DOT: Stone matrix asphalt seems to cause the most wear to Joma blades.
- **Joel Kroening**, MnDOT: Joma blades work really well on smooth roads. They work on rougher roads as well, but the surface will do damage to the blade.
- **Jon Beaufaux**, MnDOT: Concrete is tougher on Joma blades than asphalt, and probably cuts life by 15-25 percent. This is the case with steel cutting edges as well.
- **Mike Kiley**, MnDOT St. Cloud Maintenance: If the road has a high friction rating, the life span will be reduced for Joma or carbide blades.
- **Chris Cheney**, MnDOT District 1, Border Sub-Area: Joma blades seem to last longer than carbides on new bituminous surfaces, but they do not last as long as conventional carbide blades on older, rougher bituminous surfaces, which make up the majority of road surfaces in the Border Area.
- **Kevin Hoge**, MnDOT: Concrete will tear rubber off of the Joma blades.
- **Don Nobisch**, MnDOT, Austin Sub-Area Maintenance: Concrete tends to wear Joma blades faster.
- **Rod Hauenstein**, Michigan DOT: Failures of Joma blades have been due to hitting raised catch basin covers or curbs, and the worst damage was caused by blading over raised pavement markers. The state has few raised pavement markers left. (This comment was offered as a response to question number 8.)

| <b>Impact of pavement type on Joma blade life span</b> |                                  |   |
|--|----------------------------------|---|
| <b>Pavement Type Affects Joma Blade Life Span</b>      | <b>Number of Respondents</b>     | <b>Agencies</b>   |
| Yes  | Clear Roads: 9<br><br>MnDOT: 20  | Colorado DOT (1 respondent), Idaho Transportation Department (2 respondents), Iowa DOT, Missouri DOT, North Dakota DOT, Oregon DOT (1 respondent), Utah DOT, Wisconsin: Dodge County Highway Department   |
| No   | Clear Roads: 21<br><br>MnDOT: 33 | Colorado DOT (5 respondents); Idaho Transportation Department (3 respondents); Michigan DOT; Oregon DOT (6 respondents); Pennsylvania DOT; West Virginia Division of Highways; Wisconsin county highway departments: Crawford, Marquette and Waukesha counties; Wyoming DOT |

**Question 5: Agency Use of Microsurfacing Treatments**

Roughly half of respondents reported using microsurfacing treatments, both among Clear Roads members and MnDOT representatives. These treatments include seal coat, micro chip, Healer Sealer, chip seal, slurry coat, thin overlays, crack sealing, fog seal with granite chip cover rock, slurry seal, Nova Chip and fractured river rock seal coat. Many respondents did not report the type of microsurfacing used, however, which makes it difficult to gauge how prevalent any given type of microsurfacing treatment is.

| <b>Agency use of microsurfacing treatments</b>    |                                  |  |
|---|----------------------------------|--|
| <b>Microsurfacing Treatments Used on Pavement</b> | <b>Number of Respondents</b>     | <b>Agencies and Treatments Used</b>  |
| Yes   | Clear Roads: 13<br><br>MnDOT: 27 | Colorado DOT (2 respondents), Idaho Transportation Department (3 respondents), Iowa DOT, Michigan DOT, Missouri DOT, North Dakota DOT, Oregon DOT, Pennsylvania DOT, Utah DOT, Wisconsin: Crawford County Highway Department |
| No  | Clear Roads: 16<br><br>MnDOT: 27 | Colorado DOT (4 respondents); Idaho Transportation Department; Oregon DOT (6 respondents); West Virginia Division of Highways; Wisconsin county highway departments: Dodge, Marquette and Waukesha counties; Wyoming DOT     |

**Question 6: Impact of Microsurfacing Treatments**

MnDOT respondents who use microsurfacing treatments were more likely than Clear Roads members to report that those treatments have an impact on Joma blade life span. More than 60 percent of MnDOT representatives said that microsurfacing reduces Joma blade life, while only half of Clear Roads respondents did.

A few respondents quantified the impact of microsurfacing on blade life. Mike Hagen of Iowa DOT said microsurfacing cuts blade life by half, while Steven Holste of MnDOT said it would reduce blade life by about 30 percent and Mike Kiley of MnDOT St. Cloud Maintenance said that new microsurfacing can cut Joma blade life span by up to 25 percent.

Several respondents, including Jed Mulder of MnDOT District 3B, Dan Whebbe of MnDOT District 3B Elk River, Randy Strassburg of the MnDOT Little Falls Sub-Area, Kyle Nelson of MnDOT Maintenance and Dan Meinen of MnDOT noted that microsurfacing’s impact on Joma blades is most serious when it is new, but that after a few plowings the treatment will have less impact on the blade. Richard Peryer of Idaho Transportation Department and Lynn Bernhard of Utah DOT also said that fresh chip seal coats increase blade wear, although Bernhard noted that this would impact carbide blades as well.

Jill Grindle of MnDOT said she is currently testing putting a steel backer plate behind Joma blades to try to eliminate the blade’s tendency to hop or jump on certain areas of microsurfacing and mastic treatments.

| <b>Impact of microsurfacing on Joma blade life span</b> |                              |  |
|---|------------------------------|--|
| <b>Microsurfacing Type Affects Joma Blade Life Span</b> | <b>Number of Respondents</b> | <b>States/Districts</b>  |
| Yes   | Clear Roads: 6<br>MnDOT: 16  | Colorado DOT (1 respondent), Idaho Transportation Department (2 respondents), Iowa DOT, Missouri DOT, North Dakota DOT         |
| No  | Clear Roads: 5<br>MnDOT: 10  | Colorado DOT (1 respondent), Idaho Transportation Department (1 respondent), Michigan DOT, Oregon DOT (1 respondent), Utah DOT |

**Question 7: Recent Changes in Joma Blade Life Span**

Responses from Minnesota to this question differed greatly from those in other states. Only two of the Clear Roads respondents, both from Colorado, reported noticing any recent changes in the life span of Joma blades: Roger Swiger said that three sets of blades wore out within a single storm. Mark Gocha reported that Joma blade life span was previously 4,000 to 4,500 miles per set on asphalt, while this year it is down to 3,000 to 3,500 miles.

More than 40 percent of MnDOT respondents, on the other hand, said that they have noticed getting less life span from Joma blades in the past two years. This change in durability was not consistent even among those respondents who had noted it. Randy Potts of MnDOT said that the recent decrease in Joma blade life span is small but noticeable. On the other end, Dean Weber of the MnDOT Hastings Truck Station said that the initial Joma blades tried four years ago lasted three years, while he has been lucky to get one year of service from newer Joma blades.

Several respondents offered explanations for changes in Joma blade life span, including installation, weather, blade quality, road surface and underbodies. Specific comments addressing these issues follow:

- **Greg Laine**, MnDOT: If the backer blade is installed incorrectly behind the Joma blade, life expectancy is much shorter.
- **Clint Van Vickle**, MnDOT District 3A Motley: Proper installation and torque (250 foot-pounds) of the nuts are key. (Van Vickle had reported no change in Joma blade life span but offered this comment as a recommendation.)
- **Clifford E. Spoonemore**, Wyoming DOT: I had a personal lesson on how a plow blade (mold board) is set up for the individual operator (or shop). During the lesson it was noticed that most all the plows were aligned vertically at about 85°-90° angle of attack on the roadway surface. The Joma blade is set for a 60° angle of attack. This may have an effect on the life span of a Joma blade. (Spoonemore also offered this comment as a suggestion, but had not reported any change in Joma blade life span.)
- **Mike Beckermann**, MnDOT: Blades wear faster this year than last, but that may be due to drier snow falls.
- **Dawn Walker**, Colorado DOT: We have had dry storms this winter and they wear more than in heavy wetter storms.
- **Jon Beaufeaux**, MnDOT: Durability and quality appear to have slipped a bit. Operators are reporting they need to change sooner than they were prior to the date you mention.
- **Brenda Ingram**, MnDOT: Joma blades don't last quite as long. We got new concrete surface in a large portion of our route in the last three years.
- **Jacob Mortvedt**, MnDOT District 2 Roseau: We only noticed reduced Joma blade life span when they were put on underbodies a couple of years ago. We no longer use them on underbodies.

| <b>Recent changes in Joma blade life span</b>            |                              |  |
|--|------------------------------|--|
| <b>Changes in Joma Blade Life Span in Past Two Years</b> | <b>Number of Respondents</b> | <b>States/Districts</b>  |
| Yes  | Clear Roads: 2<br>MnDOT: 23  | Colorado DOT (2 respondents)   |
| No   | Clear Roads: 19<br>MnDOT: 31 | Colorado DOT (4 respondents); Idaho Transportation Department (5 respondents); Iowa DOT; Michigan DOT; Missouri DOT; North Dakota DOT; Oregon DOT (7 respondents); Pennsylvania DOT; Utah DOT; West Virginia Division of Highways; Wisconsin county highway departments: Crawford, Dodge, Marquette and Waukesha counties; Wyoming DOT |

### **Question 8: Causes of Recent Changes in Joma Blade Life Span**

Only one respondent, Mark Gocha of Colorado DOT, reported any investigation into what may be causing changes in Joma blade life span. “The first set we needed to replace this year we noticed the bolt holes had been wobbled out,” he wrote. “To ensure it is not operator error we have ensured plow blades were installed per manufacturer’s specifications and bolts torqued to specs. After 10 days, we retorqued the bolts. We are awaiting the replacement of the blades to see if the holes are wobbled.”

Five other MnDOT respondents used this question to report a regular problem with bolts on Joma blades loosening after a shift, even if they are tightened to the specified torque before the shift. Larry Capaul said that in

his experience, tightening nuts more than the specified torque eliminated the problem with loosening without affecting road-clearing ability.

## **Survey Results**

The full text of each survey response is provided below. For reference, we have included an abbreviated version of each question before the response. For the full question text, see page 4 of this report. Note that if the response to question 1 was “No,” respondents were directed to skip the other questions. Similarly, questions 6 and 8 were answered only if the answer to questions 5 and 7, respectively, were “Yes.” Finally, a few MnDOT respondents did not include contact information; these respondents are identified as “Anonymous #X.”

### **Colorado**

Michael Balerio, Colorado DOT R1, Section 5 Maintenance Facility Management, [michael.balerio@state.co.us](mailto:michael.balerio@state.co.us), 303-365-7130.

1. **Does agency use Joma blades?** No.

Mark Eike, Colorado DOT, [mark.eike@state.co.us](mailto:mark.eike@state.co.us), 970-826-5162.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** About two changes per season. (Life span is approximately 3 times that of a carbide blade.)
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Ed Gentry, Colorado DOT, [eddie.gentry@state.co.us](mailto:eddie.gentry@state.co.us), 303-546-5643.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Half the life span of double carbide blades, maybe less.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Mark Gocha, Colorado DOT, [mark.gocha@state.co.us](mailto:mark.gocha@state.co.us), 303-278-2046.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** In past years on asphalt, we would get 4,000 to 4,500 miles per set. This year we are down to 3,000 to 3,500 miles.
4. **Impact of pavement type:** No.

5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, from 4,000-4,500 miles per set in previous years to 3,000-3,500 miles per set this year.
8. **Cause of recent life span changes:** The first set we needed to replace this year we noticed the bolt holes had been wobbled out. To ensure it is not operator error we have ensured plow blades were installed per manufacturer's specifications and bolts torqued to specs. After 10 days we retorqued the bolts. We are awaiting the replacement of the blades to see if the holes are wobbled.

Rodney Richards, Colorado DOT, [rodney.l.richards@state.co.us](mailto:rodney.l.richards@state.co.us), 720-289-0073.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** One winter.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes. Crack sealing, paving.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Roger Swiger, Colorado DOT, [roger.swiger@state.co.us](mailto:roger.swiger@state.co.us), 303-359-8880.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 5-8 good storms.
4. **Impact of pavement type:** Yes, stone matrix asphalt seems to wear on them the most.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, we had three sets of blades wear out in a short period of time in one storm.
8. **Cause of recent life span changes:** No, we chalked it up to bad blades.

Dawn Walker, Colorado DOT, [dawn.walker@state.co.us](mailto:dawn.walker@state.co.us), 970-842-2852.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 3,000 to 5,000 miles.
4. **Impact of pavement type:** No. (But new concrete and the pitch of the plow blade can have an impact on the life span of the Joma blade.)
5. **Does agency use microsurfacing?** Yes, chip seals.
6. **Impact of microsurfacing:** Yes, there is a small effect but the chip seal stands up to Joma blades much better than to steel blades.
7. **Recent changes in Joma blade life span:** No, although storms this year have been dry which are known to cause more wear than heavier, wetter storms.

8. **Cause of recent life span changes:** We have not tracked the miles used for a few years.

### **Idaho**

Travis Dodd, Idaho Transportation Department, [travis.dodd@itd.idaho.gov](mailto:travis.dodd@itd.idaho.gov), 208-334-8362.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** We have one that has been in operation for 3 winter seasons and still looks good.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, several roads have been seal coated.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Steven L. Engelbert, Idaho Transportation Department, [steve.engelbert@itd.idaho.gov](mailto:steve.engelbert@itd.idaho.gov), 208-759-3927.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** Up to 6 times longer.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** [No response.]
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Bradley Lynch, Idaho Transportation Department, [brad.lynch@itd.gov](mailto:brad.lynch@itd.gov), 208-788-3365.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 6,000 to 7,000 plowing miles.
4. **Impact of pavement type:** Yes, they do not do well on a slurry cover coat.
5. **Does agency use microsurfacing?** Yes, slurry coats.
6. **Impact of microsurfacing:** Yes, the blades grabbed and dug.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Richard Peryer, Idaho Transportation Department, [richard.peryer@itd.idaho.gov](mailto:richard.peryer@itd.idaho.gov), 208-334-8361.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 2 seasons.
4. **Impact of pavement type:** Yes, we want the Joma blades for use on new chip seal coats but this

surface wears the blades faster.

5. **Does agency use microsurfacing?** Yes. Chip seal coats using 3/8- or 1/2-inch cover coat, depending on location.
6. **Impact of microsurfacing:** Yes, the blades wear faster.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

D.J. Price, Idaho Transportation Department, [d.j.price@itd.idaho.gov](mailto:d.j.price@itd.idaho.gov), 208-312-3295.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** Usually 2 seasons, but it depends on the storms.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### **Iowa**

Mike Hagen, Iowa DOT, [michael.hagen@dot.iowa.gov](mailto:michael.hagen@dot.iowa.gov), 641-425-0675.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Depends on surface type and weight of plow. We have had a lot of light snows, so we are plowing on dry roads at times.
4. **Impact of pavement type:** Yes. Concrete is best. Older asphalt is better than new, and microsurface is bad for life span.
5. **Does agency use microsurfacing?** Yes. (Type not specified.)
6. **Impact of microsurfacing:** Yes, probably cuts life span by half.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### **Kansas**

Clay Adams, Kansas DOT, [clay@ksdot.org](mailto:clay@ksdot.org), 785-836-3065.

1. **Does agency use Joma blades?** No.

### **Massachusetts**

Scott Wilson, Massachusetts DOT, [scott.wilson@dot.state.ma.us](mailto:scott.wilson@dot.state.ma.us), 857-368-9666.

1. **Does agency use Joma blades?** No.



### Michigan

Rod Hauenstein, Michigan DOT, [hauensteinr@michigan.gov](mailto:hauensteinr@michigan.gov), 517-206-5520.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** We have several units with nearly 4 winters on them.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, seal coat, micro chip, healer sealer and chip seal.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### Missouri

Tim Chojnacki, Missouri DOT, [tim.chojnacki@modot.mo.org](mailto:tim.chojnacki@modot.mo.org), 573-751-1040.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** Typically 2-3 winters.
4. **Impact of pavement type:** Yes, we've had shortened life when used on diamond-ground concrete.
5. **Does agency use microsurfacing?** Yes, we have a very limited number of sections with a 30 pound per square yard microsurface, 3/4-inch thick. It has a more macro texture than other pavement types.
6. **Impact of microsurfacing:** Yes, I would suspect they have but don't have the correlation readily available.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### Montana

Justun Juelfs, Montana DOT, [juelfs@mt.gov](mailto:juelfs@mt.gov), 406-444-7604.

1. **Does agency use Joma blades?** No.

### New York

Mike Lashmet, New York State DOT, [michael.lashmet@dot.ny.gov](mailto:michael.lashmet@dot.ny.gov), 518-457-5796.

1. **Does agency use Joma blades?** No.

### North Dakota

Aaron Auer, North Dakota DOT, [auer@nd.gov](mailto:auer@nd.gov), 701-227-6526.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** One to two years.
4. **Impact of pavement type:** Yes, fresh asphalt, microsurfacing and new concrete are much more abrasive and the Joma blades do not last as long. Any type of blade would experience shorter life

on these surfaces.

5. **Does agency use microsurfacing?** Yes, slurry and microsurfacing.
6. **Impact of microsurfacing:** Yes, shorter life.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### **Oregon**

Greg A. Adams, Oregon DOT, [greg.a.adams@odot.state.or.us](mailto:greg.a.adams@odot.state.or.us), 503 986-5816 ext. 231.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** Two winter seasons.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Joe Arnold, Oregon DOT, [joe.a.arnold@odot.state.or.us](mailto:joe.a.arnold@odot.state.or.us), 541-573-7350.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Four seasons, which run from November to April.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Robin Berheim, Oregon DOT, [robin.a.berheim@odot.state.or.us](mailto:robin.a.berheim@odot.state.or.us), 541-278-8613.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** One season.
4. **Impact of pavement type:** Yes, it seems as though the concrete wears them out a little faster than the asphalt concrete, but it is really hard to tell because all our plows run on concrete, asphalt concrete and chip seals on a shift.
5. **Does agency use microsurfacing?** No
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** We have not had to change bits since midyear last year, and we have not used the ones that we purchased this year.

Paul Howland, Oregon DOT, [paul.l.howland@odot.state.or.us](mailto:paul.l.howland@odot.state.or.us), 541-567-3338, ext. 1.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** In normal snow conditions about a year, but it depends on the conditions. Heavy slush cuts down the life by almost half.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Shawn King, Oregon DOT, [shawn.e.king@odot.state.or.us](mailto:shawn.e.king@odot.state.or.us), 541-676-5545.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Two to three normal winters.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Rich Lani, Oregon DOT, [richard.lani@odot.state.or.us](mailto:richard.lani@odot.state.or.us), 541-561-5246.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** We put on new sets in 2011 and hadn't changed them yet through the winter of 2013 because of wear, only damage done by operator.
4. **Impact of pavement type:** No, we have an even mixture of both surfaces. It would be too difficult to tell the difference.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Del Webb, Oregon DOT, [Delbert.L.Webb@odot.state.or.us](mailto:Delbert.L.Webb@odot.state.or.us), 541-563-6400.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 7+ years.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes. Chip seals and thin 1" asphalt overlays.

6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** We have not had to change bits since midyear last year, and we have not used the ones that we purchased this year.

### Pennsylvania

W. James Smith, Pennsylvania DOT, [walsmith@pa.gov](mailto:walsmith@pa.gov), 717-787-4299.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** One to two seasons.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, none specified.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### Rhode Island

Joseph Baker, Rhode Island DOT, [joseph.baker@dot.ri.gov](mailto:joseph.baker@dot.ri.gov), 401-734-4800.

1. **Does agency use Joma blades?** No.

### Utah

Lynn Bernhard, Utah DOT, [lynnbernhard@utah.gov](mailto:lynnbernhard@utah.gov), 801-965-4094.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 60 hours.
4. **Impact of pavement type:** Yes, recent chip seal jobs with basaltic or volcanic chips seem to wear on Jomas a little more. They also affect traditional carbide blades.
5. **Does agency use microsurfacing?** Yes, thin overlays.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### West Virginia

Jeff Pifer, West Virginia Division of Highways, [jeff.m.pifer@wv.gov](mailto:jeff.m.pifer@wv.gov), 304-842-1559.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 3 times the life of a standard carbide cutting edge.
4. **Impact of pavement type:** No, have only used Joma blades on HMA.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]

7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### Wisconsin

Pete Chladil, Waukesha County Department of Public Works/Highway Operations, [pchladil@waukeshacounty.gov](mailto:pchladil@waukeshacounty.gov), 262-548-7843.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** At least 1 winter season, sometimes more.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Randy L. Franks, Dodge County Highway Department, [rfranks@co.dodge.wi.us](mailto:rfranks@co.dodge.wi.us), 920-386-4007.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 2 seasons.
4. **Impact of pavement type:** Yes, less life on concrete.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Byron Henke, Marquette County Highway Department, [bhenke@co.marquette.wi.us](mailto:bhenke@co.marquette.wi.us), 608-297-3078.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** Can't really say; every storm is different.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Russ Marske, Barron County Highway Department, [russ.marske@co.barron.wi.us](mailto:russ.marske@co.barron.wi.us), 715-418-1299.

1. **Does agency use Joma blades?** No.

Todd Myers, Crawford County Highway Department, [crawsupt@centurytel.net](mailto:crawsupt@centurytel.net), 608-734-9500.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** Just started comparing Jomas with regular carbide blades.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes (but none specified).
6. **Impact of microsurfacing:** Too soon to tell.
7. **Recent changes in Joma blade life span:** No, too soon to tell.
8. **Cause of recent life span changes:** [No response.]

### Wyoming

Clifford E. Spoonemore, Wyoming DOT, [cliff.spoonemore@wyo.gov](mailto:cliff.spoonemore@wyo.gov), 307-777-6377.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** WYDOT is still testing the JOMA Blades. One truck with Precise and sensors for plow down tracked the hours and it was 224.5 hours of downtime.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

### Minnesota

Jonathan Amos, no agency specified, no contact information provided.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 3 to 4 years, depending on weather.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, one bridge diamond cut.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Jon Beaufeaux, Minnesota DOT, [jon.beaufeaux@state.mn.us](mailto:jon.beaufeaux@state.mn.us), 218-232-6800.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** It should be at least 3 times more than steel used on the same route to be cost effective.
4. **Impact of pavement type:** Yes, concrete is tougher on Jomas than asphalt, but that is the case with steel cutting edges as well. It probably cuts life by 15-25%.

5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** No. We have an approximately 8 mile section of micro, and have not noticed much difference on the wear.
7. **Recent changes in Joma blade life span:** Yes. Durability and quality appear to have slipped a bit, and operators are reporting that they need to change blades sooner than in the past.
8. **Cause of recent life span changes:** No testing has been done; just operator feedback and visually seeing worn-out edges when they change them.

Mike Beckermann, Minnesota DOT, [mike.beckermann@state.mn.us](mailto:mike.beckermann@state.mn.us), 320-223-6570.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 3 times the life of carbide.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes (no type specified).
6. **Impact of microsurfacing:** Yes, rough surfaces seem to wear blades faster.
7. **Recent changes in Joma blade life span:** Yes, blades wear faster this year than last, but that may be due to drier snow falls.
8. **Cause of recent life span changes:** [No response.]

Kim Bergstrom, Minnesota DOT Maintenance (Floodwood), [kimberly.bergstrom@state.mn.us](mailto:kimberly.bergstrom@state.mn.us), 218-476-2234.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1 1/2-2 years.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Gregory Boben, Minnesota DOT Virginia, [gregory.boben@state.mn.us](mailto:gregory.boben@state.mn.us), 218-742-1066.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** One change per year.
4. **Impact of pavement type:** No (Route consists of both).
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, could be that the truck has been used more this season.
8. **Cause of recent life span changes:** [No response.]

Ryan Callen, Minnesota DOT, [Ryan.Callen@state.mn.us](mailto:Ryan.Callen@state.mn.us), 218-365-7289.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** About 1 year, the same as metal cutting edges.
4. **Impact of pavement type:** No, although Joma blades clear the road better and is easier on the pavement.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Larry Capaul, Minnesota DOT, 952-492-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1/3 to 1/2 of a typical winter.
4. **Impact of pavement type:** No, route has all surface types.
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** If you torque the nuts as specified, they have the potential to loosen up. If you tighten them more than the specified torque, I haven't noticed a difference in cleaning ability and they don't loosen.

Chris Cheney, Minnesota DOT District 1, Border Sub-Area, [christopher.cheney@state.mn.us](mailto:christopher.cheney@state.mn.us), 218-750-0940.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** The expectation is that they should last longer than typical carbide blades, but the reality is that on most of our routes that have older, rougher bituminous surface, the Joma blades wear out just as quickly as regular carbides. Centerline rumble strips really wear out the Jomas much faster than regular carbides. Jomas do wear better on the newly paved surfaces, do a good job of clearing away the snow and slush, and some operators really like them— however, I do not see that the extra cost of Jomas is paying off, at least on our road surfaces.
4. **Impact of pavement type:** Yes, the Jomas do seem to last longer than carbides on new bituminous surfaces, and some operators really like them. However, on the older, rougher bituminous surfaces the Jomas do not last as long as conventional carbide blades. The lion's share of the road surfaces in the Border area are older, rougher surfaces and the Jomas do wear out as quickly as regular carbides. We don't have any concrete surfaces to compare the wear factor on those.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]



Steve Eastman, Minnesota DOT, District 6, Rochester, [steven.eastman@state.mn.us](mailto:steven.eastman@state.mn.us), 507-450-5479.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 4 seasons.
4. **Impact of pavement type:** No, the area only has asphalt pavement.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No, still using original set.
8. **Cause of recent life span changes:** [No response.]

Randy Glaser, Minnesota DOT Mankato, [randy.glaser@state.mn.us](mailto:randy.glaser@state.mn.us), 507-514-1010.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3 times the length of the normal carbide.
4. **Impact of pavement type:** Yes, red rock seal coats wear them prematurely.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, they don't last as long as they used to.
8. **Cause of recent life span changes:** No, it's very hard to track actual use time and conditions vary from storm to storm.

Jeff Graves, Minnesota DOT, [jeffrey.graves@state.mn.us](mailto:jeffrey.graves@state.mn.us), 218-768-3043.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 1 season.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, the first set that we used lasted about 50% longer.
8. **Cause of recent life span changes:** [No response.]

Jill Grindle, Minnesota DOT, [jill.grindle@state.mn.us](mailto:jill.grindle@state.mn.us), 763-682-1633.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 2 to 3 times longer than steel carbides; almost a full season.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes. (Not specified.)
6. **Impact of microsurfacing:** The Joma blades will hop or jump on certain areas of microsurfacing

and mastic treatments. I now have put a steel backer plate behind the Jomas to eliminate the problem, but haven't used them long enough to evaluate the wear. I anticipate they will still last a lot longer than steel carbides.

7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

John Hodena, Minnesota DOT District 1, [john.hodena@state.mn.us](mailto:john.hodena@state.mn.us), 218-940-9298.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2-3 times longer than old blades.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Kevin Hoge, Minnesota DOT, [kevin.hoge@state.mn.us](mailto:kevin.hoge@state.mn.us), 218-821-5928.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%
3. **Typical Joma blade life span:** 1 winter.
4. **Impact of pavement type:** Yes, concrete will eat them up a little faster and tear rubber off of them.
5. **Does agency use microsurfacing?** Yes, granite chips, although not in the last few years, and slurry coat (granite) on Highway 169.
6. **Impact of microsurfacing:** No
7. **Recent changes in Joma blade life span:** Yes, At first they would last longer on our underbodies, but they weren't cutting like steel when they had less pressure on them. When we turned the pressure up they wore faster but still didn't cut as well as steel.
8. **Cause of recent life span changes:** [No response]

Steven Holste, Minnesota DOT, [steven.holste@state.mn.us](mailto:steven.holste@state.mn.us), 320-293-8555.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1 season.
4. **Impact of pavement type:** Yes. "Surface treated bit, i.e. micro, etc."
5. **Does agency use microsurfacing?** Yes. Micro surface.
6. **Impact of microsurfacing:** Yes, life span is shorter by approximately 30%.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Stephen Hufnagle, Minnesota DOT, [stephen.hufnagle@state.mn.us](mailto:stephen.hufnagle@state.mn.us), 218-683-8016.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 3 years.
4. **Impact of pavement type:** No, we only have bituminous in our area.
5. **Does agency use microsurfacing?** Yes, very minimal, in two small towns.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No, we are still using our original shipment.
8. **Cause of recent life span changes:** [No response.]

Brenda Ingram, Minnesota DOT, [brenda.ingram@state.mn.us](mailto:brenda.ingram@state.mn.us), 218-485-5425.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** [No response.]
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, they don't last quite as long. We got new concrete surface in a large portion of our route in the last three years.
8. **Cause of recent life span changes:** We have not done any testing.

Gary Kennedy, Minnesota DOT, District 2, [gary.kennedy@state.mn.us](mailto:gary.kennedy@state.mn.us), 218-308-4403.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1 winter season, but we have gotten up to 2 seasons.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes (none specified).
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, some seem not to last as long.
8. **Cause of recent life span changes:** [No response.]

Mike Kiley, Minnesota DOT, St. Cloud Maintenance, [mike.kiley@state.mn.us](mailto:mike.kiley@state.mn.us), 320-223-6569.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1 season in an average year.
4. **Impact of pavement type:** Yes, if the road has a high friction rating, the life span of the cutting edge is shortened. This is the case with Joma blades or carbide blades.
5. **Does agency use microsurfacing?** Yes, a large amount of microsurfacing, with contracted microsurfacing on super commuter asphalt roads and small projects done by the agency.

6. **Impact of microsurfacing:** Yes, it seems that a newly microsurfaced road cuts the life of the Joma blades by up to 25%. After the first winter, it seems that the microsurfacing has less effect on the Joma blades.
7. **Recent changes in Joma blade life span:** No, I don't believe that we have used them enough to recognize a difference.
8. **Cause of recent life span changes:** [No response.]

Shawn King, Minnesota DOT, DL Maintenance, [shawn.king@state.mn.us](mailto:shawn.king@state.mn.us), 218-846-7979.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** We could get a full year out of the early ones. Last year it seems like they lasted longer than the ones this year.
4. **Impact of pavement type:** Yes, seems like they wear down faster on the micro seals.
5. **Does agency use microsurfacing?** Yes, on TH 10 east of Detroit Lakes.
6. **Impact of microsurfacing:** Yes, they wear out faster.
7. **Recent changes in Joma blade life span:** Yes, older ones lasted longer.
8. **Cause of recent life span changes:** No.

Joel Kroening, Minnesota DOT, [joel.kroening@state.mn.us](mailto:joel.kroening@state.mn.us), 507-251-1947.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 2-3 times the life of carbide.
4. **Impact of pavement type:** Yes, they work really well on smooth roads, but rougher roads will do damage to the Joma blades.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Greg Laine, Minnesota DOT, [greg.laine@state.mn.us](mailto:greg.laine@state.mn.us), 218-340-4835.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1 year.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, if the backer blade is installed incorrectly behind the Joma blade, life expectancy is much shorter.
8. **Cause of recent life span changes:** [No response.]

Curt Larson, Minnesota DOT, [curtis.larson@state.mn.us](mailto:curtis.larson@state.mn.us), 218-683-8023.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** We hope to get close to 3 seasons use on our plows.
4. **Impact of pavement type:** Yes, some of the coarser asphalt mixtures seem to be more abrasive and wear edges faster.
5. **Does agency use microsurfacing?** Yes (very few).
6. **Impact of microsurfacing:** Yes, not sure.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Bryan Lilile, Minnesota DOT, [bryan.lillie@state.mn.us](mailto:bryan.lillie@state.mn.us), 507-327-5092.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** [No response.]
4. **Impact of pavement type:** Yes. New concrete wears them out faster.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, they do not last as long and are falling apart.
8. **Cause of recent life span changes:** [No response.]

Don Mehren, Minnesota DOT Maintenance, [donald.mehren@state.mn.us](mailto:donald.mehren@state.mn.us), 507-205-6408.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1 season.
4. **Impact of pavement type:** Yes, we have a fractured river rock seal coat that wears them out fast; otherwise just bit overlay, where they wear good.
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** Yes, they wear faster.
7. **Recent changes in Joma blade life span:** Yes, they seem to wear faster.
8. **Cause of recent life span changes:** No.

Dan Meinen, Minnesota DOT, [dan.meinen@state.mn.us](mailto:dan.meinen@state.mn.us), 763-689-7086.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 15 events or approximately 7,000 lane-miles.
4. **Impact of pavement type:** No, many routes are a mixture of both material types.
5. **Does agency use microsurfacing?** Yes, fog seal with granite chip cover rock and slurry seal.
6. **Impact of microsurfacing:** Yes, 5 passes on a new microsurface treatment will take 1/3 to 1/2 off

of the life of a Joma blade.

7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Allen Milbradt, Minnesota DOT, [allen.milbradt@state.mn.us](mailto:allen.milbradt@state.mn.us), 218-304-3030.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1 full winter season.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, it seems like we had longer life span on earlier trials with the Jomas.
8. **Cause of recent life span changes:** [No response.]

Hugh Miller, Minnesota DOT, [hugh.miller@state.mn.us](mailto:hugh.miller@state.mn.us), 218-969-9554.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1 or 2 sets per year.
4. **Impact of pavement type:** Yes, chip seal is a little harder on them.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Jacob Mortvedt, Minnesota DOT, District 2 Roseau, [jacob.mortvedt@state.mn.us](mailto:jacob.mortvedt@state.mn.us), 218-463-2821.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1 season for front plows, 1/3 season for underbodies.
4. **Impact of pavement type:** No, only have asphalt.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, we no longer use them on underbodies.
8. **Cause of recent life span changes:** [No response.]

Jed Mulder, Minnesota DOT, District 3B Lake Area, [jed.mulder@state.mn.us](mailto:jed.mulder@state.mn.us), 320-293-8557.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 1.5 sets per year per truck.

4. **Impact of pavement type:** [No response.]
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** Yes. New microsurfacing will trip the plow. After 3 or 4 events, the surface gets worn enough to run the blades on the surface.
7. **Recent changes in Joma blade life span:** [No response.]
8. **Cause of recent life span changes:** [No response.]

Tim Murphy, Minnesota DOT, 952-492-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3/4 of a year, depending on snowfall.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, but nothing applied in the past 2 years.
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** Yes, the first blades received I thought had slots where the bolts went through; now there is one hole so there is no adjusting.
8. **Cause of recent life span changes:** We have lots of problems with bolts coming loose every shift after being torqued to spec.

Rich Nadeau, Minnesota DOT, [richard.nadeau@state.mn.us](mailto:richard.nadeau@state.mn.us), 952-476-3260.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3-4 good storms.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes.
8. **Cause of recent life span changes:** [No response.]

Kyle Nelson, Minnesota DOT Maintenance, [kyle.nelson@state.mn.us](mailto:kyle.nelson@state.mn.us), 952-492-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 2 months with less snow; 3+ months with more snow.
4. **Impact of pavement type:** Yes, microseal and chip seal seem to wear them more.
5. **Does agency use microsurfacing?** Yes, chip seal and microseal.
6. **Impact of microsurfacing:** Yes, when it's new, blades wear quicker, although this effect is reduced as the microsurface wears.
7. **Recent changes in Joma blade life span:** Yes, current blades seem to be separating between the carbides.
8. **Cause of recent life span changes:** [No response.]

Don Nosbisch, Minnesota DOT, Austin Sub-Area Maintenance, [donald.nosbisch@state.mn.us](mailto:donald.nosbisch@state.mn.us), 507-456-5342.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2-3 years.
4. **Impact of pavement type:** Yes, concrete tends to wear faster.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, but the cause is believed to be events where they had to use the plow to clear snow that only covered a small part of the lane.
8. **Cause of recent life span changes:** [No response.]

Randy Potts, Minnesota DOT, [randy.potts@state.mn.us](mailto:randy.potts@state.mn.us), 507-360-7383.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3 times the life span of standard carbides.
4. **Impact of pavement type:** Yes, new concrete is hard on Joma blades, but it's hard on every type.
5. **Does agency use microsurfacing?** No, just chipseal.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, they may not last as long as originally. It's not a huge difference, but it's noticeable.
8. **Cause of recent life span changes:** No.

Justin Rasmusson, Minnesota DOT Jordan, [racer7485@hotmail.com](mailto:racer7485@hotmail.com), 952-492-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** No.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** Hadn't used Joma blades before last year. However, he has noticed that bolts loosen after a normal plow shift. It also seems that the driver's side wears out faster than the rest of the blade.

David Redig, Minnesota DOT, [david.redig@state.mn.us](mailto:david.redig@state.mn.us), 507-286-7575.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 1-2 seasons, depending on road surface.



4. **Impact of pavement type:** Yes, sealcoats and micro-surfaced areas are tougher on Jomas and all blades.
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** Yes, no impact specified.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Wally Rosier, Minnesota DOT Metro, 952-442-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2-3 months.
4. **Impact of pavement type:** Yes, chip seal is harder on all blades, Jomas included.
5. **Does agency use microsurfacing?** Yes, chip seal.
6. **Impact of microsurfacing:** Shortens life span.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Darrick Rust, Minnesota DOT District 4, Morris TS, [darrick.rust@state.mn.us](mailto:darrick.rust@state.mn.us), 218-849-8407.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Twice as long as carbide.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Bruce Schlueter, Minnesota DOT, [bruce.schlueter@state.mn.us](mailto:bruce.schlueter@state.mn.us), 320-234-8463.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Typically 2-3 times that of steel with carbide, but it depends on type of storm, type of plow they are on and type of road surface.
4. **Impact of pavement type:** Yes, some shorter life on concrete and surfaces with Nova Chip.
5. **Does agency use microsurfacing?** Yes, Nova Chip.
6. **Impact of microsurfacing:** Only if you consider Nova Chip as a microsurface.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Wes Smith, Minnesota DOT District 6, [wesley.smith@state.mn.us](mailto:wesley.smith@state.mn.us), 507-446-5504.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2 seasons.
4. **Impact of pavement type:** Yes, new seal coat and Nova chip will speed up wear, usually reducing life span to less than one season.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, although he believes it is due to dry snow this winter.
8. **Cause of recent life span changes:** [No response.]

Robert Solomon, Minnesota DOT, [robert.solomon@state.mn.us](mailto:robert.solomon@state.mn.us), 320-245-2324.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 1 winter season.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Randy Strassburg, Minnesota DOT, Little Falls Sub-Area, [randy.strassburg@state.mn.us](mailto:randy.strassburg@state.mn.us), 218-232-6803.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2-3 times that of carbide.
4. **Impact of pavement type:** [No response.]
5. **Does agency use microsurfacing?** Yes, micro-seal.
6. **Impact of microsurfacing:** Granite in the micro-sealing shortens Joma blade life span, although this would also shorten carbide blade life. The first year of the micro-seal's life span is hardest on blades.
7. **Recent changes in Joma blade life span:** No, the staff believes the area has had more events and more dry snow events that result in more wear.
8. **Cause of recent life span changes:** Operators have expressed very favorable comments on the Joma blades, and would like to see them used on underbodies.

Paul Traxler, Minnesota DOT, Jordan Truck Station, 952-215-9643.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3-4 good storms.

4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** No, Joma life span seems fine on treated road.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Brad Vance, Minnesota DOT, Monticello Truck Station TG, [brad.vance@state.mn.us](mailto:brad.vance@state.mn.us), 763-295-5525.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** Approximately two times of normal carbide.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes, I think they don't last as long as people think. I'm our inventory person and they don't last as long as the company says. But they are quite a bit quieter.
8. **Cause of recent life span changes:** As described above.

Clint Van Vickle, Minnesota DOT, District 3A Motley, [clint.vanvickle@state.mn.us](mailto:clint.vanvickle@state.mn.us), 218-352-6208.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 50 to 75%.
3. **Typical Joma blade life span:** 3-4 times the life span of steel carbide blades. A set of Joma blades and carbide blades were both installed on the underbodies of trucks on the same day in December 2013; the steel carbide blades wore out 1/21/14, while the Joma blades had 85% life span left in them. Both trucks run similar pavements with underbody down pressure at 500 psi.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes, chip seal.
6. **Impact of microsurfacing:** Yes, they shorten the life span of all cutting edges.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** Proper installation and torque (250 foot-pounds) of the nuts are the key.

Dean Weber, Minnesota DOT, Hastings Truck Station, [dean.weber@state.mn.us](mailto:dean.weber@state.mn.us), 651-775-0324.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** 2 to 3 years.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes (none specified).
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** Yes, we had our initial Joma blade for trial use 4 years ago, and that one lasted 3 years. We have had Joma blades for the last 2 years now, and we are

lucky if they last 1 year. They seem to last twice as long as our steel edges, but they used to last at least 3 times longer.

8. **Cause of recent life span changes:** [No response.]

Rick Weber, Minnesota DOT 3B Lakes Area Buffalo Shop, [rkweber@lakedalelink.net](mailto:rkweber@lakedalelink.net), 612-227-4365.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 25 to 50%.
3. **Typical Joma blade life span:** Average.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** Yes (none specified).
6. **Impact of microsurfacing:** No.
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Dan Whebbe, Minnesota DOT, District 3B Elk River, [daniel.whebbe@state.mn.us](mailto:daniel.whebbe@state.mn.us), 763-441-2545.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 1 season.
4. **Impact of pavement type:** No, don't see a difference between two routes that have different combinations of pavement types.
5. **Does agency use microsurfacing?** Yes.
6. **Impact of microsurfacing:** Operators say that when they hit the micro section, the truck will bog down. This only lasts part way through the season; after a few plowings and knocking off the top of the new micro, they don't notice it affecting the plowing any longer.
7. **Recent changes in Joma blade life span:** No. Too many variables to factor. So far most of my trucks started the season on a used edge from last year, and most have made one change. This winter has had a lot of scraping due to the wind and cold temps. A look at how many wing cutting edges have been changed this year is a good indication. Both of my routes also have uneven pavement, which needs to be factored in as it will wear in the same spot. We have saved some of the old good edges and just replaced the worn out section with a half worn edge.
8. **Cause of recent life span changes:** No tests have been made.

Brian Wolfgram, Minnesota DOT District 6, [brian.wolfgram@state.mn.us](mailto:brian.wolfgram@state.mn.us), 507-951-2442.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 0 to 25%.
3. **Typical Joma blade life span:** 3 times as long as other blades; 1 normal season.
4. **Impact of pavement type:** Yes, new concrete surfaces or rough or patched asphalt surfaces wear Joma blades faster, although they will wear carbide faster as well.
5. **Does agency use microsurfacing?** Yes, fog seal with granite chip cover rock and slurry seal.
6. **Impact of microsurfacing:** Yes, 5 passes on a new microsurface treatment will take 1/3 to 1/2 off of the life of a Joma blade.

7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Tim Zierden, Minnesota DOT, [tim.zierden@state.mn.us](mailto:tim.zierden@state.mn.us), 507-456-5343.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 2 to 3 seasons.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Anonymous #1, Minnesota DOT, no contact information provided.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3 months.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** No.
8. **Cause of recent life span changes:** [No response.]

Anonymous #2, Minnesota DOT, Jordan, 952-492-2160.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** Approximately 5,000 miles, although it wears faster on bare pavements due to low snow amounts.
4. **Impact of pavement type:** Yes, rough asphalt wears more if there is not much snow, although snow-covered roads have no difference.
5. **Does agency use microsurfacing?** Yes, although respondent has no experience with.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Life span is good, although nuts will loosen with use no matter the torque or whether a single-lock nut or regular double nut is used.
8. **Cause of recent life span changes:** [No response.]

Anonymous #3, Minnesota DOT, no contact information provided.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.

3. **Typical Joma blade life span:** Depends on circumstances; could be months to a year.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** No.
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** Yes.
8. **Cause of recent life span changes:** Nuts on blades keep coming loose at the end of each shift, even though they have been torqued to spec.

Anonymous #4, Minnesota DOT, no contact information provided.

1. **Does agency use Joma blades?** Yes.
2. **Percentage of Joma blades:** 75 to 100%.
3. **Typical Joma blade life span:** 3 times longer than a regular blade.
4. **Impact of pavement type:** No.
5. **Does agency use microsurfacing?** [No response.]
6. **Impact of microsurfacing:** [No response.]
7. **Recent changes in Joma blade life span:** [No response.]
8. **Cause of recent life span changes:** [No response.]

## **Related Resources**

**Clear Roads Product Experience Feedback for 2006-2013 Winter Seasons**, Clear Roads, 2013.  
[http://www.clearroads.org/downloads/06-13\\_Combined-Clear-Roads-Prod-Exp-Results-Web.pdf](http://www.clearroads.org/downloads/06-13_Combined-Clear-Roads-Prod-Exp-Results-Web.pdf)

**Evaluation of Snow Plow Blade Systems, Final Evaluation.** Andy Mastel, North Dakota Department of Transportation, Materials and Research Division, December 2011.  
[http://www.dot.nd.gov/divisions/materials/research\\_project/mr201003final.pdf](http://www.dot.nd.gov/divisions/materials/research_project/mr201003final.pdf)

**“Indexable Tools are a Safe Haven from Increased Carbide Tool Prices,”** Chuck Elder, *Production Machining*, March 2006.  
<http://www.productionmachining.com/columns/indexable-tools-are-a-safe-haven-from-increased-carbide-tool-prices>

**JOMA Plow Blade Evaluation**, Ohio Department of Transportation, Division of Highway Operations, Office of Maintenance Administration, Field Operations Section, June 2010.  
[http://www.dot.state.oh.us/divisions/operations/maintenance/snowandice/snow\\_and\\_ice\\_best\\_practices/joma\\_plow\\_blade\\_evaluation\\_report\\_%28final\\_june\\_28,\\_2010%29.pdf](http://www.dot.state.oh.us/divisions/operations/maintenance/snowandice/snow_and_ice_best_practices/joma_plow_blade_evaluation_report_%28final_june_28,_2010%29.pdf)

**“Maintenance Testing New Blades,”** Christina Andersen, *Inside*, Iowa Department of Transportation, February 2009.  
[http://www.iowadot.gov/inside/inside\\_february\\_2009.pdf](http://www.iowadot.gov/inside/inside_february_2009.pdf)

**Maintenance Innovations and Efficiencies: 0714-JOMA Snow Plow Blades**, Utah Department of Transportation, undated.  
<https://sites.google.com/a/utah.gov/maintenance-innovations-and-efficiencies/innovations-cattle-guards-to-oms/efficiencies-cattle-guards-to/winter-maintenance-1/0714-joma-snow-plow-blades>

**New Hampshire DOT 2009 Annual Report**, New Hampshire Department of Transportation, 2009.  
<http://www.nh.gov/dot/media/documents/2009AnnualReport.pdf>