

AASHTO – Materials Engineer Survey

State conducting survey: **Michigan Department of Transportation** (initiated May 8, 2008 - results summarized May 23, 2008)

Survey on 'State DOT's Perspective Relative to the Use of Volumetric Concrete Mixers (Mobile Mixers) For State and Federally Funded Projects'

State DOT	Does your state DOT permit the use of volumetric mixers (mobile mixers) in lieu of transit or central mixed concrete?	If so, where do you permit and/or restrict their usage?	Do you have any additional comments relative to usage or restriction of volumetric mixers (mobile mixers)?	State Specifications, if provided	Person Responding And Contact Information
Alabama	Yes	As an alternative for concrete used on minor structures (headwalls, inlets, etc.). Concrete required must be three cubic yards or less, and written approval must be granted prior to use.	ALDOT requires that all ready mix plants maintain an NRMCA certification. Mobile mixers are not inspected by NRMCA which puts the burden of inspecting the equipment on ALDOT. There are not too many requests for using this type of volumetric concrete mixers.		Sergio Rodriguez RodriguezS@dot.state.al.us
Arizona	Yes	We allow concrete to be mixed in a mobile mixer at the site for all classes of concrete except Class P (Portland Cement Concrete Pavement), provided written permission of the Engineer is granted.	Mobile mixers are rarely, if ever, used on our projects.		Gregg Inman GInman@azdot.gov
Florida	Yes	We allow their use for non- structural concrete. Typical applications would be; sidewalk, ditch pavement, fence posts, basically any unreinforced concrete placements.	We require that these vehicles be registered with the Volumetric Mixers Manufactures Bureau (VMMB) and have a rating plate approved by them. In addition, we typically will have them verify their ability to batch a known volume. The demonstration usually requires that they build a container to hold 1 cubic yard of concrete, show their calculations for batching that volume then batch in accordance to those calculations.		Michael Bergin, PE michael.bergin@dot.state.fl.us
Georgia	Yes	No restrictions on usage.	Volumetric mixers have been used for curb and gutter, patching, undersealing and bridge deck overlay. GDOT's maintenance forces own and use volumetric mixers. Equipment must meet the requirements of Subsections 500.3.02.A&B.	http://tomcat2.dot.state.ga.us/thefsource/specs/index.html Select 'Bridges' and then select folder labeled '500-Concrete Structures'.	Myron Banks mbanks@dot.ga.gov
Hawaii	Yes	HDOT permits the use of mobile mixers to batch high early strength concrete on projects where accelerated concrete paving or repair work is required.			Gerry Carnate Gerobin.Carnate@hawaii.gov

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Illinois	Yes	It is allowed for small isolated structures, thin overlays (bridge deck latex most common), controlled low-strength material, pavement/bridge deck patching involving very rapid set (specialty cements involved), miscellaneous items, and incidental items.	Field personnel emphasize the need to make sure equipment is calibrated.		Douglas Dirks Douglas.Dirks@illinois.gov
Kansas	Yes	See spec (154.1.d)	The more seasoned the operator(s), the better success you'll have. Also, recommend trial batching prior to <u>every</u> job.	http://www.ksdot.org/burConsMain/specprov/2007/154.pdf	Rick Kreider, Chief RickK@ksdot.org
Kentucky		Kentucky uses mobile mixers mainly for latex concrete overlays on bridge decks but by spec they can be used on Class A and B mixes. Please see our Kentucky Method at the attached link: http://transportation.ky.gov/materials/download/kymethods/km31208.pdf .	Please see the link. I only recall a contractor using a mobile mixer on one project in the last eight years that was not a latex bridge deck overlay.		Ross Mills Ross.Mills@ky.gov
Louisiana	On a limited basis.	They have been specified for high density thin overlays, roadway patching, and we are allowing for minor concrete.	The number of requests to use them has greatly increased in the last few months. We are developing a protocol for project-basis certification and will probably soon review our policy for using them. We see the advantage of no travel time, but the disadvantage of re-calibrating the aggregate-cement weight measurement system almost daily. Would be interested in your results.		Luanna Cambas LuannaCambas@dotd.la.gov
Maryland	We do allow the use of volumetric mixers in limited, specific applications only.	We currently allow the use of these mixers when applying latex modified concrete overlays. Additionally, we have allowed the use of mobile mixers (although not preferred) for concrete patching applications. The preferred method is transit mix from a central batching facility. We have also allowed mobile mixers for very small quantity applications such as concrete pole and sign bases. From a logistical standpoint it is advantageous when moving from location to location.	The batching and mixing unit shall conform to ASTM C-685. It is critical that the equipment is kept in calibration and checked on a frequent basis.		Paul Finnerty PFinnerty@sha.state.md.us

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Michigan	Yes, on a very limited basis.	We currently permit their use for latex-modified concrete overlays and patches. Also, they may be used, when approved, for prepackaged fast setting materials.	MDOT will calibrate each of the contractor's mobile mixers for the applicable non-structural concrete mixes on a quarterly basis.		John F. Staton statonj@michigan.gov
Minnesota	All concrete overlays on bridges use mobile mixers (the top 2" of almost all bridge decks have low-slump concrete overlays). Concrete Mobiles are also sometimes used for concrete pavement repair (CPR) projects. Any other case would be if special situations occur by approval of the Engineer only.	(see question #1) Generally, not used for general concrete work.	Make sure that they are calibrated. The calibration procedure is in the Mn/DOT Concrete Manual. We have a video of the calibration procedure that is available.		Doug Schwartz Doug.Schwartz@dot.state.mn.us
Mississippi	Mississippi DOT does not address them in our specifications, so I guess they are technically <i>not</i> allowed.		I don't believe anyone in MS has one.		Adam Browne, P.E. abrowne@mdot.state.ms.us
Missouri	MoDOT does allow the use of volumetric mixers.	The contractor needs to request permission, in writing, from the engineer. Have used volumetric mixers on bridge deck overlay (i.e. latex modified concrete and low slump concrete) projects. Have also used on one dowel bar retrofit project with excellent results. When a transit mixer is used it is not uncommon to take over an hour to place all of the concrete in the drum. After an hour, the concrete is difficult to place and consolidate due to poor workability. This increases the chance that additional water will be added to the concrete mix leading to poor performance. Using a volumetric mixer enables the contractor to produce just enough concrete to install the dowel bars for a particular location.	The volumetric mixer including the aggregates are not allowed on the bridge during operation. Volumetric mixers are not practical for large volume projects.		William Stalcup William.Stalcup@modot.mo.gov

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Nebraska	No		We used to use volumetric concrete mixers for production of High Density Low slump concrete for bridge deck applications years ago.		Moe Jamshidi mjamshid@dor.state.ne.us
Nevada	Yes	The Nevada DOT has used volumetric mixers on a case by case basis as requested by the contractor. This batching has been allowed on projects where a batch plant is not located within a reasonable distance.	The mobile mixers we have seen have not been able to produce consistency between batches with any reliability.		Griswold, Michael mgriswold@dot.state.nv.us
New York	Yes	Their use can be anywhere, provided they can produce the mix specified (which is not always possible).	NY allows the use of mobile mixers per our standard specifications, Section 501-2.04C.	https://www.nysdot.gov/portal/page/portal/main/business-center/engineering/specifications/specs-repository/section500.pdf	Donald A. Streeter, P.E. dstreeter@dot.state.ny.us William Goss wgoss@dot.state.ny.us
New Jersey	Yes	By specification there is currently no restriction to their usage in supplying concrete.	Typical usage of "mobile" concrete mixers in New Jersey has been for bridge deck overlays, large pavement or deck repairs, and guiderail/ BCT installation. Due to the small capacity of these mixers and slow placement rates they are not practical for most of our concrete work. We have used these mixers in other concrete work such as curb and sidewalk when no approved concrete plants could deliver and discharge redi-mix concrete within the time limits.		Michael McDonald Mike.McDonald@dot.state.nj.us
North Carolina	No, we do not allow the use of these mixers at this time.				Samuel J. Frederick sjfrederick@dot.state.nc.us
Ohio	Yes but only for latex modified concrete overlays. All other concrete fall under C94				Lloyd Welker Lloyd.Welker@dot.state.oh.us

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Ontario Ministry of Transportation	In general, no. While we do allow their use for latex modified concrete overlays, these are very rarely specified.	In the past, we prohibited the use of mobile mixers for structural concrete. When our specifications were revised in 2007, based on past experience and the fact that mobile mixers were not in fact being used for any of our work, we removed their use from our specifications altogether.	In general we do not feel that their accuracy of batching is adequate for our work. Attached is our concrete materials specification, including requirements for production and batching. See clause 1350.07.01 regarding mobile mixers.		Hannah Schell Hannah.Schell@ontario.ca
Pennsylvania	Yes, Pennsylvania does permit the use of volumetric mixers on a limited basis.	By specification their use is limited to producing concrete for endwalls, inlets, manholes, end anchors, sign posts, and similar miscellaneous structures requiring small quantities of concrete. Also, these type mixers are routinely in use for placement of latex modified concrete mixes for bridge deck overlays. Their use is strictly prohibited for pavements, pavement patching and bridge structures. Only truck mixed or central mixed concrete is permitted for these larger type operations.	These volumetric units are required to be calibrated annually before usage. Also, before use on a specific mix design, a yield check is run to verify the design is being met. Overall, Pennsylvania DOT sees very little concrete from these type of mixers.		William J. Miller, P.E. wijmiller@state.pa.us
South Carolina	Only on special cases!	On overlay projects.	SCDOT does not allow the use of volumetric mixers due to the disadvantage of re-calibrating the aggregate-cement weight measurement system on daily basis. During any overlay project, our inspector must be there to calibrate the mixer and ensure that the mix ingredients are according to SCDOT specs.		Aly Hussein, PhD, P.E. husseinaa@scdot.org
South Dakota	Yes	Mobile mixers are commonly used for Bridge Deck low slump overlays and sometimes for PCCP Repair Project. They are not allowed for new PCCP or new structural concrete.	Getting the Mobile mixer calibrated for the mix design is a chore. And after it's calibrated doing a 1/4 yd3 yield check is necessary to verify at beginning of each placement that the calibration is still valid.		Darin Hodges Darin.Hodges@state.sd.us

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Texas	Yes	Originally in our 2004 specs, we had no restrictions. However, after a couple of bad experiences where a contractor thought they could produce the concrete themselves with a volumetric mix truck, we then put in the following special provision: Unless allowed by the plans or the Engineer, volumetric mixers may not supply classes of concrete identified as structural concrete in Table 5.	<p>As always, the really good ones work fine, but anything below really good is not good enough for anything other than curb and gutter/side-walk/etc. It seems that the performance is so human dependant (how well do they maintain the truck? How well are the materials loaded into the truck?), that you could have a company where you get good concrete 50% of the time, terrible concrete 25% of the time and lousy concrete the other 25%.</p> <p>Project testing for things like slump also creates a problem for our specs and inspectors. Running a slump test 15 seconds after the water hit the cement isn't exactly the best, but we don't provide them guidance telling them to let the wheelbarrow sit for while and then test.</p> <p>What else can you do when you are doing full-depth repairs on concrete and you have less than 8 hours from start of traffic control through sawing, through placing concrete until the removal of traffic control? And it's a long haul? Often, volumetric mixers are the only choice.</p>		Elizabeth Lukefahr ELUKEFA@dot.state.tx.us
Utah	UDOT does not allow the use of volumetric mixers.	We have, on a couple of occasions, allowed contractors making small batches for partial depth repairs to try the mixers, but the consistency was not sufficient to meet our needs.			Tim Biel tbiel@utah.gov
Virginia	Virginia DOT permits the use of volumetric mixers. However, the method of mixing shall be approved by the Engineer prior to the start of concrete work.	Volumetric concrete mixers are routinely used for producing latex concrete for bridge deck overlays. Minimal usage occurs in other applications.	The volumetric mixer shall be calibrated to proportion the mixture accurately and shall have been certified within 60 days prior to use on the project for the type of material specified. The yield must be within ± 1.0 percent. A recording meter, visible at all times and equipped with a ticket printout, shall indicate the calibrated measurement.		Larry J. Lundy, P.E. Larry.Lundy@vdot.Virginia.gov

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West Virginia	Yes	Volumetric mixers are permitted to be used for incidental construction items and are not permitted in bridge, box culvert, pavement, or retaining wall construction.	We do permit them to be used for the construction of specialized concrete overlays (such as latex modified concrete). This is where we see them used most often.		Michael A Mance Mike.A.Mance@wv.gov
Wisconsin	Our general chapter on concrete masonry states "Use volumetric mixers only for work that specifically allows volumetric proportioning." Our standard mix proportioning methodology is weight-based. Therefore, volumetric mixers are not allowed for most concrete work, except for specific items where site-mixed concrete is required or allowed.	Site mixing with volumetric mixers is REQUIRED for our low-slump bridge deck overlays. It is also ALLOWED for various miscellaneous low-volume items such as mortar for dowel bar retrofit, remote precast operations for concrete stay-in-place deck forms, concrete repairs, etc.	As long as volumetric mixers are in good operating condition and are properly calibrated, we have had pretty good luck with them.		James Parry james.parry@dot.state.wi.us