



## WSDOT's QMB System – Application Guidance

**What is QMB?** Quickchange Movable Barrier. A dynamic barrier system that expands and contracts to provide positive work zone protection while maintaining traffic flow. Click the link below for more information.

<http://www.barriersystemsinc.com/#/moveable-barriers-home>

### Why use QMB?

Many projects could benefit from safety, mobility and constructability advantages, but it's not for every project. (For more information, see the attached design guide)

**WSDOT already owns QMB and it's available for use on WSDOT projects.**

16,000 feet of quickchange moveable barrier (QMB).

2 - Transfer/Transport Vehicle Model 3 (TTV).

**Find out** if your project would be a good candidate to consider for QMB. The following guidance offers valuable information gathered from previous WSDOT experience, a manufactures design guide, example special provision, cost estimating information and resource contacts.

**Designing a traffic control strategy with QMB:**

WSDOT and FHWA emphasize the use of positive protection devices in works zones. Guidance in the Design Manual Chapter 1010.10 lists one option to use QMB. A work zone impact analysis may indicate a need to consider a barrier protected work area and QMB may provide a level of protection above that of temporary concrete barrier with more flexibility.

The most common method where QMB is used is a shoulder application. During peak traffic hours the barrier is on the shoulder protecting equipment, materials, drop-off etc but not encroaching on traffic lanes. During off-peak hours, adjacent lanes can be closed and the QMB moved out into the closed lane to provide a larger protected work area or a work/haul vehicle access lane. Existing lanes could be narrowed to provide a buffer space to place the barrier when the entire existing shoulder is the work area.

Another strategy consideration, for locations that traffic volumes would allow it, such as on a divided highway is a long duration one direction total closure with a traffic crossover and using QMB as a moveable median to change the number of lanes in a direction to accommodate peak traffic flow. Lane width reductions and adequate shoulder depths for traffic will most likely be required.

A similar strategy can be used for divided highways with an existing median barrier. One side of the highway can be closed with traffic crossing over to the side. The QMB is moved off the existing median barrier to provide separation from opposing traffic and the existing median barrier provides protection for the work area. This could be done for nightly work operations or weekend closure type operations and returning all the lanes in both directions during peak times.

Roadway and bridge widening projects that require maintaining high speed multilane traffic are the most common category for potential QMB use, but many others could be easily evaluated as well.

*To summarize, any long duration project where it is desirable to provide positive protection that expands and contracts between traffic and the work area could be considered for QMB.*

## **How to include WSDOT's QMB in your TMP:**

Early planning and scheduling is required to include QMB as part of your Transportation Management Plan (TMP) for a project. Barrier and Transfer Machines are also available for rent through Barrier Systems Inc. This may be an option if the WSDOT QMB or TTV's are not available, but of course the cost will be higher.

Include the special provision [WSDOTQMB](#) to supplement section 6-10 of the Standard Specifications for the Contracting Agency provided QMB and TTV. This special provision provides information about the QMB, TTV and contact information for the manufacturer Barrier Systems Inc. The Contractor will be required to pick up the barrier and vehicle from the location provided and in accordance with the dates to be provided.

Contract pay items created by the inclusion of the special provision are:

“Initial Delivery and Placement of QMB” Lump Sum.

This item will pay for pickup from listed location, placement in the initial location per the traffic control plans, training Contractors operators and final delivery back to the listed location.

(Use \$15 per foot for the amount of QMB to be used on the project.)

“Moving QMB with TTV” per Linear Foot.

Pays for all costs of operating the TTV including fuel and maintenance.

(Use equipment operators time and estimated fuel use to move a run of QMB and calculate a per foot estimate. As little as \$0.05 per foot has been bid when short runs of QMB have been moved daily and up to \$1.50 per foot for longer runs move only a few times in a project.)

“TTV Mobilization” Lump Sum

For all costs associated with transporting the TTV throughout the project.

(It requires a trailer to deliver the TTV. Consider the distance the delivery to the project site. Range on projects has been \$1,500 to \$5,000)

**“Removing and Resetting QMB” per Linear Foot.**

Use if your project will require the QMB to be move longitudinally to another location on the project or to a temporary storage location during the contract.

(Use \$11 per foot)

**“Force Account Replacement Parts for TTV”**

This pays only for parts due to normal wear and tear of the TTV per section 1-09.6 Item 2.

(\$10,000 estimate)

In general, past experience has shown that QMB may be somewhat more expensive when compared to traditional temporary concrete barrier. However, when you consider the benefits beyond fixed in place temporary concrete barrier, such as reduced lane closure costs, more protected work area for the contractor and continuous positive protection, dollars alone do not provide a true comparison.

**Traffic control plans and other issues:**

Site specific traffic control plans will be required to show the QMB location(s) on the project or in each project stage. Temporary impact attenuators may be required to protect the QMB ends (The Absorb 350 was developed specifically for use with QMB and connects to and moves with the QMB via the TTV) or a TMA may be used on some applications. Guarding the QMB end behind existing barrier, guardrail or locating outside of the clear zone may be an option. Associated traffic control plans with signing, devices, and temporary channelization will be needed when the QMB moves effecting traffic operations. A protected location should be shown on the plans for the TTV when not in use. The cost of using WSDOT owned QMB and TTV's on contracts versus Temporary Concrete Barrier has been somewhat higher even though they are provided "free" to the contractor. The Contractor must still mobilize barrier onto and off the project and there are operating costs to operate the TTV in moving the QMB as needed to establish the protected work area. The advantage of QMB is the traffic control strategies that are not possible with temporary concrete barrier. Workers, equipment and the work site can be protected during working and non-working hours even when work requires short duration lane closures. TEF charges for the QMB no longer apply as the cost of the QMB has been amortized though use on previous contracts. There is a small TEF charge for the TTV machine at the rate of \$4.38/per hour (2008 hours/per year).

## **QMB Resource Contacts**

*Plan ahead, use of the QMB must be scheduled in advance.*

Contact Cathy Arnold in NWR at (206) 440-4771 to determine availability.

For additional guidance on using the QMB system on your project, feel free to contact the [Headquarters Work Zone Safety Team](#) or one of the following Project Managers that have QMB experience.

- Kevin Waligorski, NCR
- Lisa Hodgson, NWR

Barrier Systems Company is also a good resource. Contact Byron West at 707-374-6800