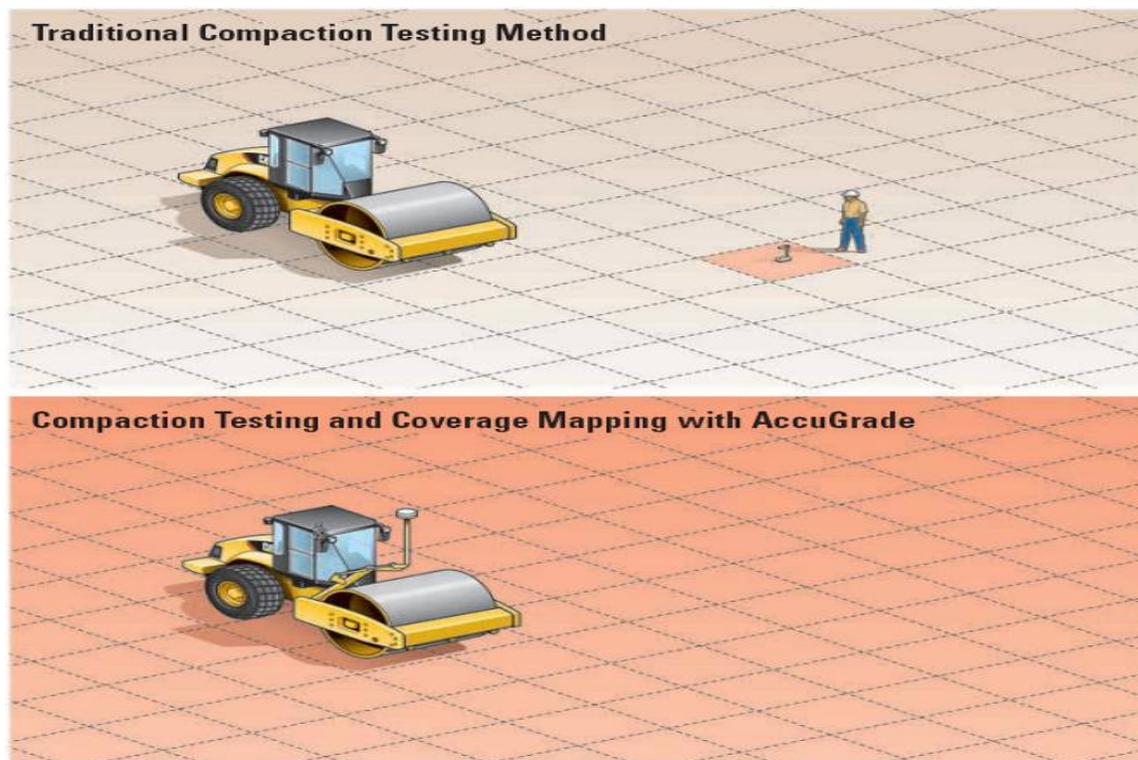
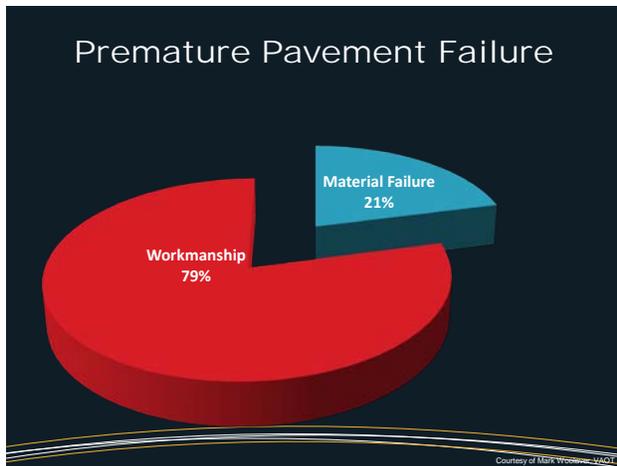


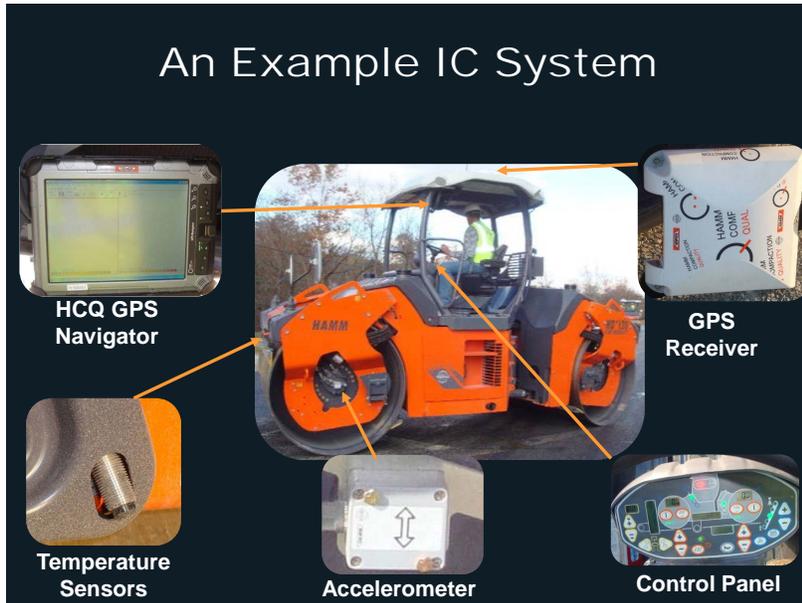
Hot Mix Asphalt with Intelligent Compaction

Proper compaction of hot mix asphalt is one of the most important process in construction of a long lasting pavement. Pavement materials must be compacted to optimum densities to ensure adequate support, stability, and strength—achieving these densities uniformly is the key to long lasting roadway performance. Current procedures using conventional compaction equipment and spot location density testing may result in inadequate and/or non-uniform material densities. Inadequate compaction is one of the major factors in premature pavement failure.



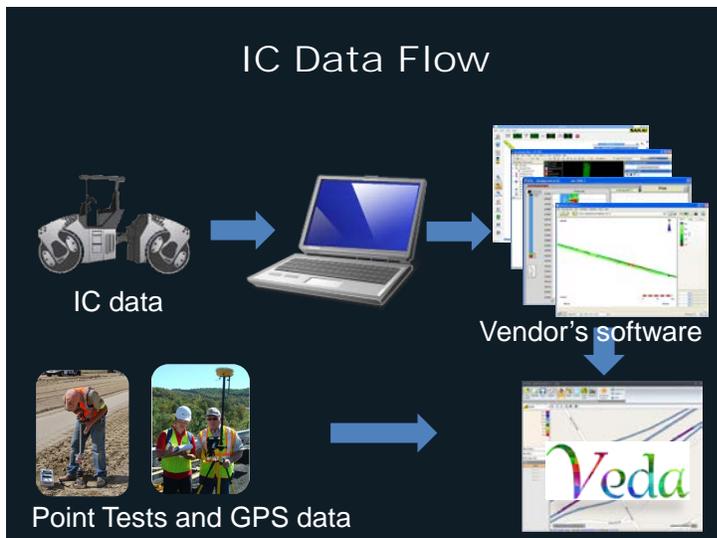
Intelligent Compaction rollers are used in compaction of hot mix asphalt for breakdown and intermediate compaction for method compaction process and for density required HMA. The

current nssp 39-8 requires use of steel drum vibratory roller equipped with GPS, temperature sensor, accelerometer data acquisition system and displays. Pneumatic rubber tired roller equipped with GPS, temperature sensors, data acquisitions system, and displays (Automated machine guidance pneumatic rubber tired roller)is also used to keep track of the number of passes and the mix temperature.



The two components of compaction, compactive effort and mix temperature, can be monitored and controlled when Intelligent compaction technology is used. The operator can visually determine the number of passes, temperature and the stiffness of the compacted mix from the on board displays. This capability allows the contractor to achieve the desired quality by adjusting the compactive effort and the mix temperature when needed.

The continuous data collected by the rollers can be processed using FHWA Veda software to create a daily compaction quality control report to ensure that Caltrans specification required roller passes, material temperature and material density are met.



Intelligent Compaction Target Values and Compaction Quality Control Report

The following tables outline the specified temperature and number of passes for construction of HMA. The Intelligent compaction target values are based on the specification. Although Intelligent Compaction is not used for acceptance, however the contractor must meet the target values. The generated compaction quality control report will indicate the percentage of the time or coverage that the contractor meets the target values.

Hot Mix Asphalt Intelligent Compaction Target Values Method Compaction

IC Requirements	HMA Type A Unmodified Asphalt Binder	HMA Type A PG-M Asphalt Binder	RHMA-G
Breakdown Compaction Minimum Temperature °F 1 st PASS	250	240	285
Breakdown Compaction Number of Passes	3	3	3
Intermediate Compaction Minimum Temperature °F Last Pass	190	180	250
Intermediate Compaction Number of Passes	3	3	3

Hot Mix Asphalt Open Graded Friction Course (OGFC) Intelligent Compaction Target Values Method Compaction

IC Requirements	OGFC Unmodified Asphalt Binder	OGFC PG-M Asphalt Binder	OGFC RHMA-O RHMA-HB
Breakdown Compaction Minimum Temperature °F 1 st PASS	240	240	280
Complete Compaction Minimum Temperature °F Last Pass	200	180	250
Minimum Number of Passes	2	2	2

**Warm Mix Asphalt
Intelligent Compaction Target Values
Method Compaction**

IC Requirements	HMA Type A Unmodified Asphalt Binder	HMA Type A PG-M Asphalt Binder	RHMA-G
Breakdown Compaction Minimum Temperature °F 1 st PASS	240	230	260
Breakdown Compaction Number of Passes	3	3	3
Intermediate Compaction Minimum Temperature °F Last Pass	190	170	230
Intermediate Compaction Number of Passes	3	3	3

**Warm Mix Asphalt
Open Graded Friction Course (OGFC)
Intelligent Compaction Target Values
Method Compaction**

IC Requirements	OGFC Unmodified Asphalt Binder	OGFC PG-M Asphalt Binder	OGFC RHMA-O RHMA-HB
Breakdown Compaction Minimum Temperature °F 1 st PASS	230	230	270
Complete Compaction Minimum Temperature °F Last Pass	190	170	240
Minimum Number of Passes	2	2	2