In a commuter line within a large metropolitan area, it is important to predict train delay in several tens of minutes after when small train disturbance occurs. In practice, train delay is often predicted on the assumption that the situation continues for several tens of minutes. However, it is difficult to accurately predict the delay because it actually changes in a complex way. To build an accurate prediction method, we developed a method using Long Short Term Memory. In this paper, we report the result of the performance evaluation of the improved prediction method.