

# Smarter Inventory Management

## Forecasting public transportation needs with the complete software package

The Montreal Transit Corporation operates a mixed fleet of 1,680 conventional buses and 84 nine-car subway trains to serve the people of the island of Montreal. We maintain our fleet of vehicles through eight bus depots, one bus overhaul shop, one bus body shop, one metro major overhaul shop, and two metro minor repair shops. In 2010, the American Public Transportation Association named the Montreal Transit Corporation the Outstanding Public Transit System in North America.

Here in the supply chain group, our mission is to meet or exceed service performance commitments to the company's operating units. In other words, we need to have the right part, in the right place, at the right time, and at the lowest overall cost. We must be able to define the optimal trade-off point between the cost of holding inventory and the operational availability of equipment. To accomplish this, we acquired the SmartForecasts software suite, which we hoped would optimize our new and spare parts inventories and better manage availability and parts distribution within our network.

### Program functionality

SmartForecasts is graphically similar to any Windows-based product and is intuitive to learn and use. The program runs on local systems and integrates with IMAFS—our inventory management, optimization, and planning suite—which uploads historical data and parameters to SmartForecasts and receives forecast information back. (See Figure 1.) IMAFS then performs monthly and yearly recalculation of safety stocks, reorder points, and order lot sizes of all existing items. In the

past, recalculation of item parameters was done only when we experienced recurring stockouts. Mechanization of the recalculation process enables us to maintain optimal inventory for the service levels identified for each item as a function of the item's yearly reclassification into A, B, C, or safety, for example. As a result, we do not rely as heavily on intuition to identify trends.

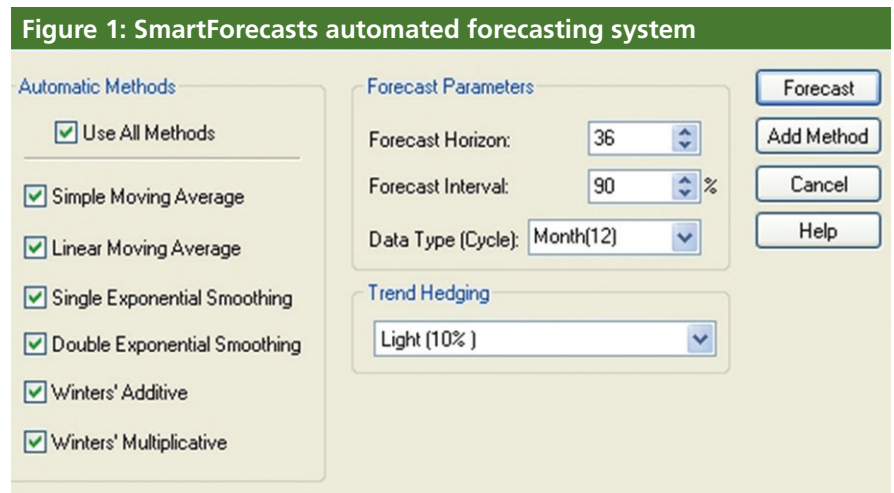
We also use SmartForecasts as a standalone planning system to forecast consumption of critical items whose forecasting horizons are longer than

the resupply time (typically between 24 and 36 months) and when preparing calls to renew long-term contracts for certain product groups such as hardware, sanitary materials, and clothing. With better forecasts, we can guarantee minimum order quantities throughout the course of the contract and forewarn suppliers of needs in advance. This translates into better prices, shorter lead times, and more reliable delivery.

### Installation and support

Implementation was performed over a four-month period, including some modification to enable integration with our inventory management system. When performing setup, there is a full array of configurations for the data table, forecast parameters, trend hedging, numeric precision, and other functions. Documentation is simple and straightforward, and we were provided with a full tutorial.

We contact Smart Software through calls and emails and have found that response and resolution times range from immediately to one or two business days, depending on the severity of the issue. The support staff is friendly and extremely knowledgeable about the product.



Users can select from several forecasting methods and parameters.

## Best features

For regular demand forecasting, one of SmartForecasts' most effective features is automatic method selection with least error for each item, which is chosen from six time series forecasting methods. This allows for fast preliminary forecasting of a great number of items without having to manually determine in advance which is the best method to use for each one.

SmartForecasts also provides another interesting feature in intermittent-demand forecasting, which estimates the consumption over the lead time by using a proprietary method, whereby samples of historical data produce thousands of demand forecast scenarios. (See Figure 2.) It then is possible to determine the stock level necessary to meet desired service levels.

## Product summary

**Product name**  
SmartForecasts

**Type of program**  
Forecasting and planning suite

**Vendor**  
Smart Software  
Four Hill Road  
Belmont, MA 02478  
+1-617-489-2743 or  
1-800-SMART-99  
[smartcorp.com](http://smartcorp.com)

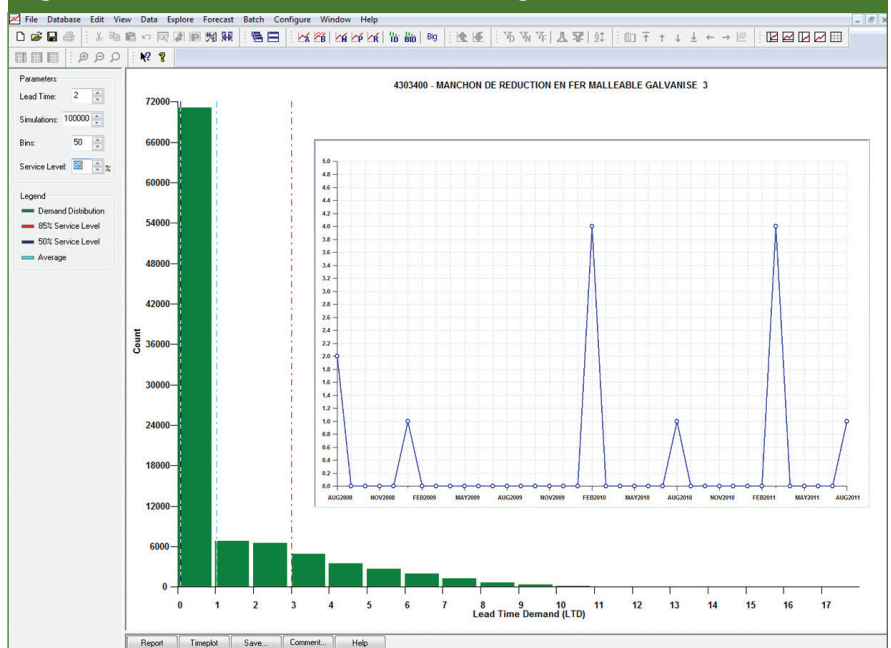
**System requirements**  
Microsoft Windows operating system  
Pentium 4 with at least 512 MB RAM or better recommended

Forecast results can be presented numerically or graphically, highlighting historical trends and demand patterns to facilitate comprehension. (See Figure 3.) It is possible to graphically correct abnormalities in the historical data on the fly, which is a great time saver.

## Shortcomings

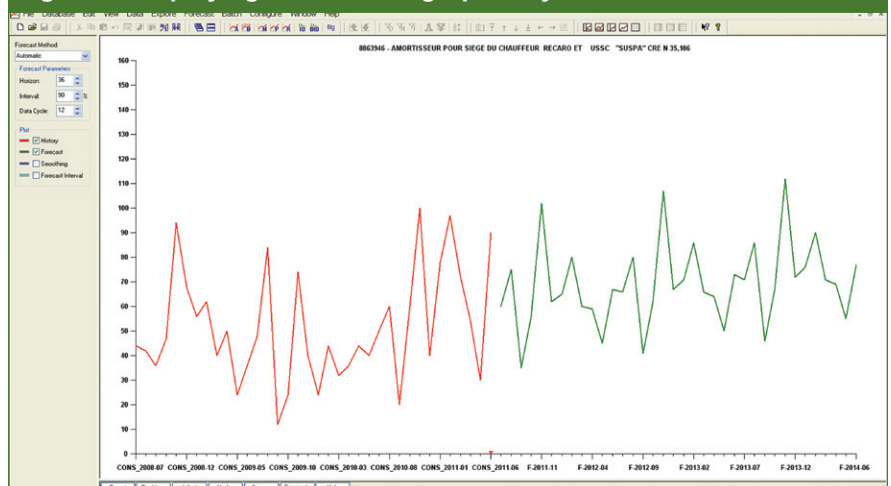
While more of a challenge than a shortcoming, we have found that interfacing with a database requires computer skills greater than the average user possesses. While the program supports easier-to-perform Excel uploads and downloads, a database

**Figure 2: Intermittent-demand forecasting**



A proprietary method is used to forecast stock items with intermittent demand.

**Figure 3: Displaying information graphically**



Viewing forecast data graphically illustrates trends such as seasonality.

link needs to be set up by someone proficient in database management.

### Proven results

SmartForecasts has greatly improved the quality of our stock management parameters by relying on best-of-breed, objective predictions rather than simply averaging the past, and it has enabled us to react rapidly when demand patterns change. The software was instrumental in Montreal Transit Corporation achieving an increase of 18 percent in parts availability (to 94 percent), with a net reduction of parts in stock of \$4.4 million CAD (to \$29.2 million). It also has enabled us to more quickly and accurately forecast any specific item. Here in the supply chain group, demand forecasting is an integral part of our stock management best practices. SmartForecasts helps meet our customers' needs and fulfill our mission of having the right parts at the right time and the lowest cost possible.

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### Vendor comments

The Montreal Transit Corporation needed to reduce and optimize its parts inventory. This required a radically improved approach to forecasting demand and consumption patterns, especially for the sizeable portion of parts that experience intermittent demand. Intermittent demand, where many periods of zero demand are interspersed with periods of seemingly random inventory consumption, is exceptionally difficult to forecast. Services and spare parts are prone to the phenomenon, which presents a difficult planning challenge. A highly specialized, effective demand planning solution that addresses all types of demand enables organizations to safely reduce their inventory investments while maintaining or improving service levels. This is precisely the value the Montreal Transit Corporation found in SmartForecasts.

Users of SmartForecasts experience nearly 100 percent accuracy in their ability to meet defined service levels. Users can satisfy service level requirements for critical items with long replenishment lead times or set lower inventory levels for less crucial parts that can be replenished more quickly, and they can do this with confidence.

None of this would be possible if the software did not integrate well with existing supply chain and enterprise resources planning (ERP) systems. SmartForecasts is completely non-intrusive and able to easily transmit and return demand forecast, safety stock, and other results to these systems. Additionally, Smart Software's import/export module practically eliminates the need for any information technology team involvement in data exchange.

Best-in-class demand forecasting and inventory optimization solutions such as SmartForecasts help fulfill mission-specific mandates and more general requirements such as increased cash flow. SmartForecasts provides the functionality to deliver better results, faster payback, and higher return on investment at a lower total cost of ownership than alternatives offered as part of an integrated ERP solution.

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