



Flow Planner –Tugger Routes Case Study

Summary:

The logistics team at a global agricultural/construction equipment manufacturer in Kansas, along with a Proplanner engineer, used Proplanner’s Flow Planner solution for material flow analysis a to increase the tugger route efficiency in their plant.

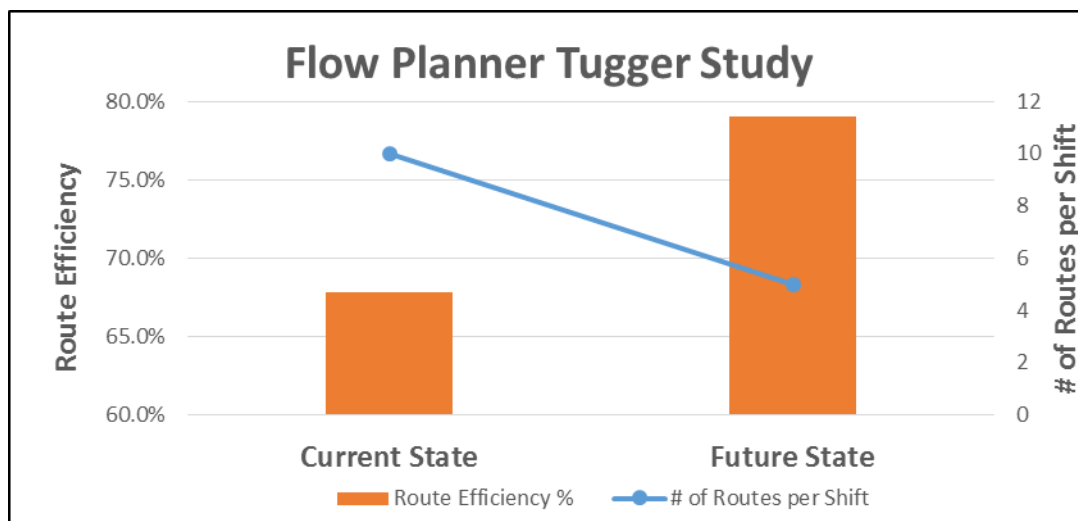
The results highlight the power of using a solution that can easily calculate, quickly manipulate, and visually display material flow results. In 5 days, Flow Planner was used to evaluate the current state, assess potential changes, and finalize a future state. Flow Planner calculated current time to complete all deliveries, distance traveled, total driving time, and total handling time, and the routes were color-coded and visually displayed on an AutoCAD plant facility drawing. Changes in route assignments and delivery times were made and the results were quickly evaluated in Flow Planner to come to a 17% increase in efficiency of the tugger routes with a simultaneous annual labor cost reduction of \$80,000.

Flow Planner Tugger Module Results



17% Route Efficiency Increase

\$80,000 Annual Labor Cost Reduction



Written By:

Ceara Kirchner (ceara@proplanner.com)

[Contact Proplanner](#)

Overview – Flow Planner:

Proplanner's Flow Planner is an AutoCAD plug-in that can automatically generate material flow diagrams and calculate material handling travel distances, time, cost, and other metrics. With variable-width lines color-coded by product, part or material handling method, users quickly see how layouts should be arranged and where excessive material handling should be eliminated from the manufacturing process.

In Flow Planner's Tugger (tow-train) route design module, the user inputs container and cart capacity; load and unload times; warehouse, staging and delivery locations; and a uniform, triangular, scheduled or sequenced delivery schedule for each part. The traveling salesman algorithm is then applied to create optimal tugger route paths and associated time and volume for each route.

Background:

This global equipment manufacturer outsources the labor and management of their plant material flow logistics to a company that specializes in warehouse labor management. However, the delivery schedule, material flow and tugger routes are determined by the manufacturer's internal logistics team. Although this logistics team works closely with the warehouse labor management company, they suspected that there was opportunity for greater efficiency in the assembly line tugger delivery routes. The current tugger routes had not been modified since they were originally designed, to adapt to the plant's growth. The logistics team did not have an efficient or visual method for establishing the utilization of the current routes and thus creating a baseline from which to make future tugger route improvements.

Solution:

The manufacturer brought Proplanner to their site two times totaling five days during a one month period. During the first three day session, Proplanner worked with the manufacturer to establish the project goal of reducing the number of tugger drivers per shift. The part delivery schedule, location and time data collected by the manufacturer before Proplanner arrived was reviewed to ensure all necessary data was available.

Next, Proplanner taught the manufacturer how to enter and manipulate the data into the Tugger module of Flow Planner. Once the data entry was complete, the current tugger routes were mapped out as color-coded paths on the plant AutoCAD drawing. Together they reviewed Flow Planner's calculated results of each current route, including time to complete all deliveries on a route, distance traveled in the route, time spent driving, and time spent handling.

A few weeks later, Proplanner returned to the plant for two days. During this time, they helped the manufacturer analyze the calculated time needed to complete all deliveries against the time allowed in a shift. Routes that were not at expected time capacity were identified. Using Flow Planner, the deliveries on those routes could be quickly combined with other routes and the results calculated to determine if there was an improvement in utilization of the available time. These combinations were established as new tugger routes. The new tugger routes were entered into Flow Planner to be mapped on the plant AutoCAD drawing and the time to complete the new routes was calculated.

Results:

Tugger drivers were assigned to the new routes and it was determined that only 5 tugger drivers per shift would be needed to complete all the required part deliveries on time. In this first attempt of improving tugger routes by combining current route part deliveries, a savings of \$80,000 per year or 2 full time tugger drivers was established. The manufacturer implemented these new tugger routes and will continue to use Flow Planner as the evaluation tool for future tugger route changes that will further increase productivity and savings.