Popularized by the success of the Toyota Production System (TPS), many companies strive to incorporate the principles of lean manufacturing into the management of their supply chains. Explicitly incorporating lean principles further complicates the underlying optimization problems involving the routing and inventory decisions of the supply chain. To understand the implications of the lean philosophy on supply chain logistics, we examine a lean production system consisting of a single manufacturing plant and a set of geographically-dispersed suppliers. Each supplier supplies a distinct product (component) to the plant. We consider the development of an inbound logistics plan to supply the manufacturing plant in a manner that supports the lean principles of level production planning and standardized work. We present a mathematical model whose optimal solution establishes a cyclic inbound routing plan that collects component inventory from suppliers and delivers it to the plant at the minimum system-wide inventory holding cost and transportation cost over a specified period of days.