Since static solutions for time periods $T + 1, T + 2, \ldots$ are not derived, it is assumed that the conditions existing in period T will be infinitely perpetuated. Thus the assembly, elimination transportation, packing, and distribution costs associated with T are the assumed present value of the costs for T, $T + 1, \ldots$.

Dynamic Model

The dynamic programming model which determines the optimal path of adjustment is

(3) $$v_t^*(s) = \underset{r}{\text{minimum}}\ [v_{t,s} + N_{t,sr} + v_{t+1}^*(r)];\ t = 1, \ldots, T;$$

where

$v_t^*(s)$ = the cost of the best dynamic solution beginning with configuration s in period (stage) t,

$v_{t,s}$ = the discounted assembly, packing, and distribution cost of configuration s in period t,

$N_{t,sr}$ = the discounted transition cost of moving from configuration s in period t to configuration r in period $t + 1$,

$v_{t+1}^*(r)$ = the cost of the best dynamic solution beginning with configuration r in period $t + 1$.

Sweeney and Tatham develop a method to determine the maximum number of different configurations considered in each period. Suppose the static model for each period is solved for the best R_t solutions. Let v_{t1} denote the cost of the best static configuration in period t. Then $v^1 = \sum_t v_{t1}$ is the sum of the minimum cost configurations over the planning horizon. Since transition costs are not included, v^1 is a lower bound on the optimal multiperiod solution.

Let v^u be the total cost of any feasible solution to the multiperiod problem, and let $v^\Delta = v^u - v^1$. Sweeney and Tatham show that, in each period, one only need consider those static solutions with cost v_{tc} where $v_{tc} - v_{t1} \leqslant v^\Delta$. In other words, if the difference between two static solutions in t is less than the difference between two dynamic solutions (v^Δ), the largest static solution is included in the dynamic program. Thus, it is necessary to consider only the best R_t^* solutions where $v_{t,R_t^*} - v_{t1} \leqslant v^\Delta$ and $v_{t,R_t^*+1} - v_{t1} > v^\Delta$.

If R_t^* is relatively large, considerable time and expense is expended to generate the solutions. After R_t solutions ($R_t < R_t^*$) are generated, one may evaluate the need for additional static solutions, Sweeney and Tatham show that the maximum improvement in the least-cost, dynamic