TECHNOLOGY ROADMAP:

WHOLE HOUSE AND BUILDING PROCESS REDESIGN

Year One Progress Report

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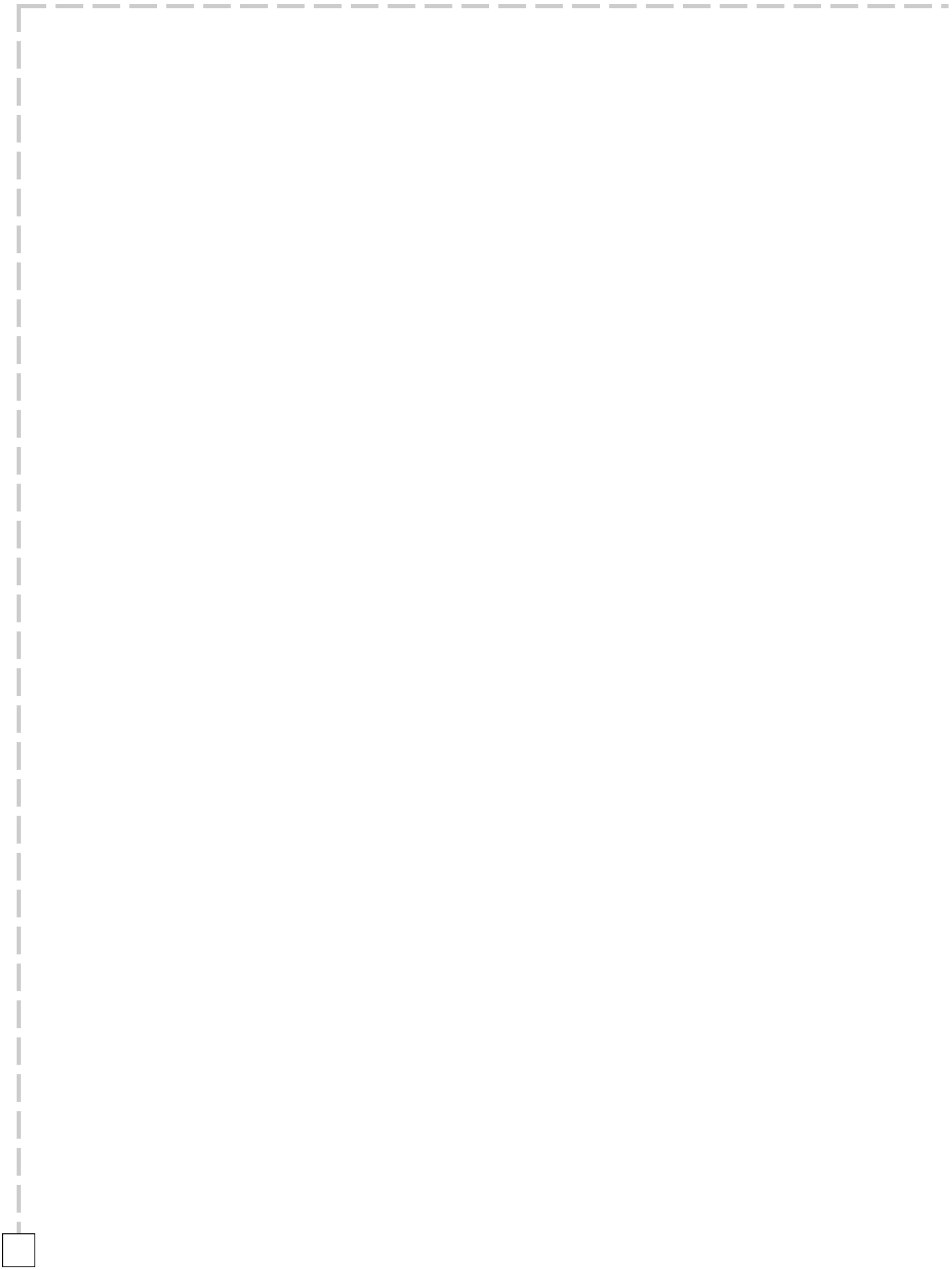
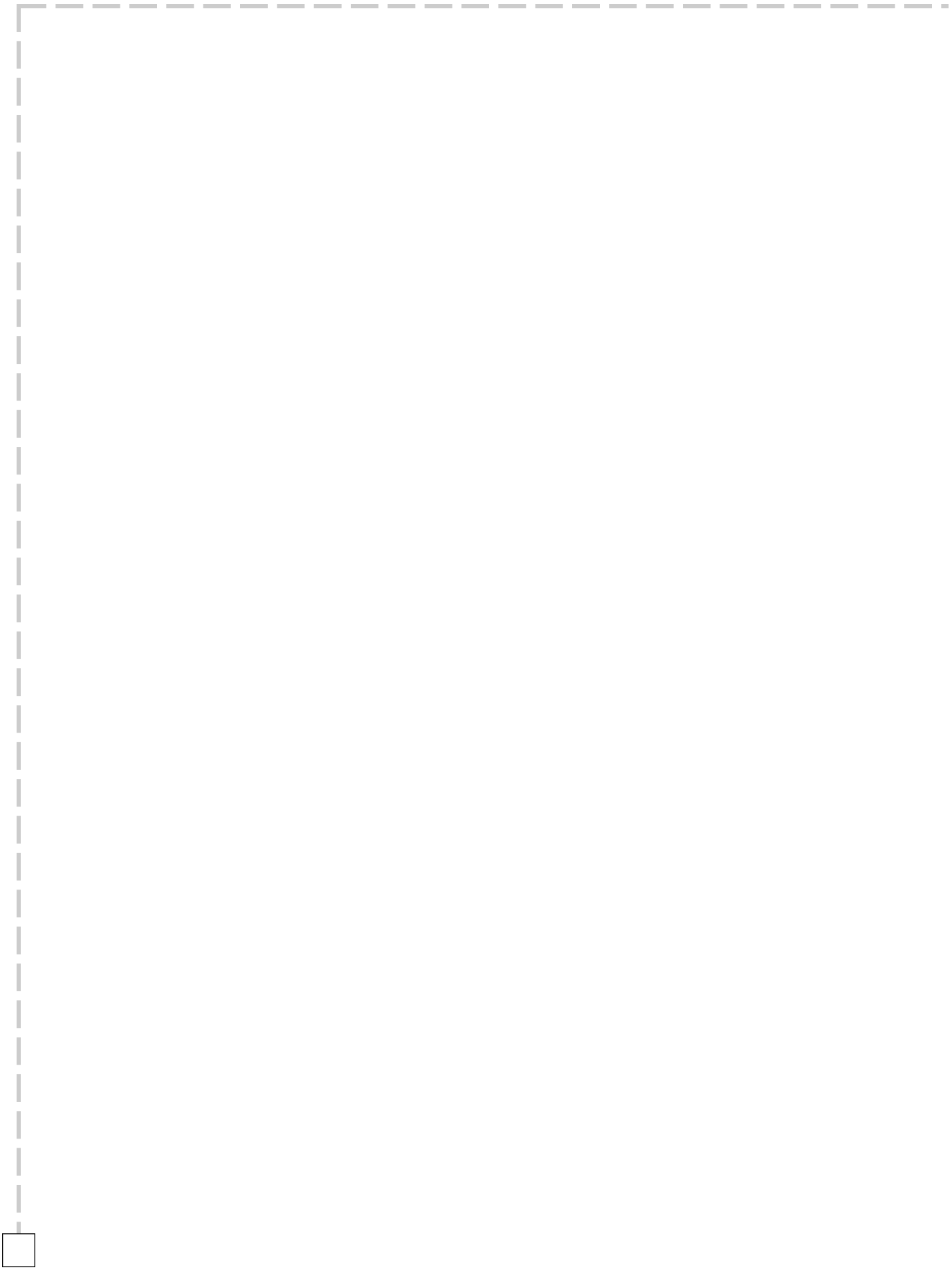


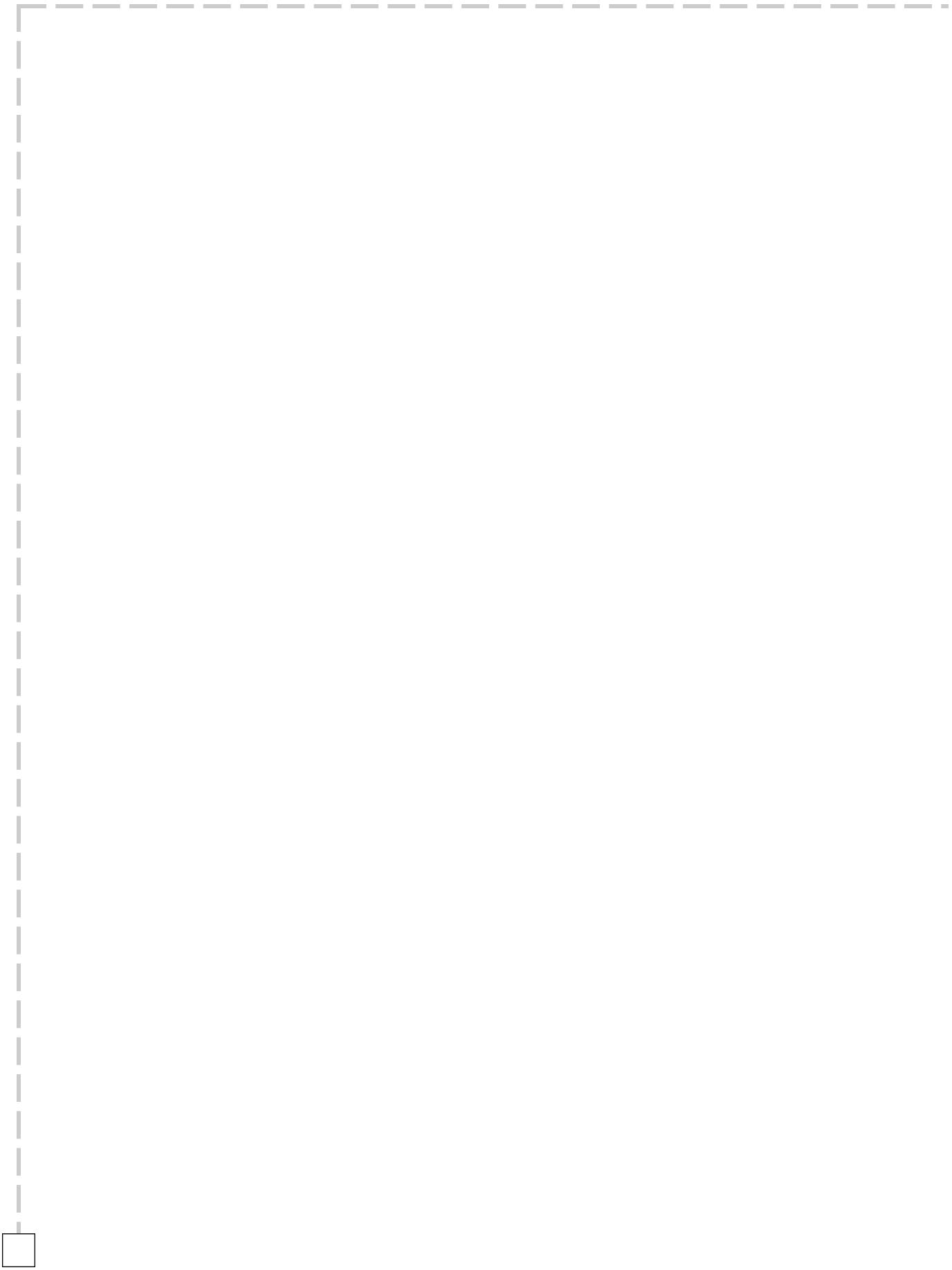
PATH PROGRAM GOALS

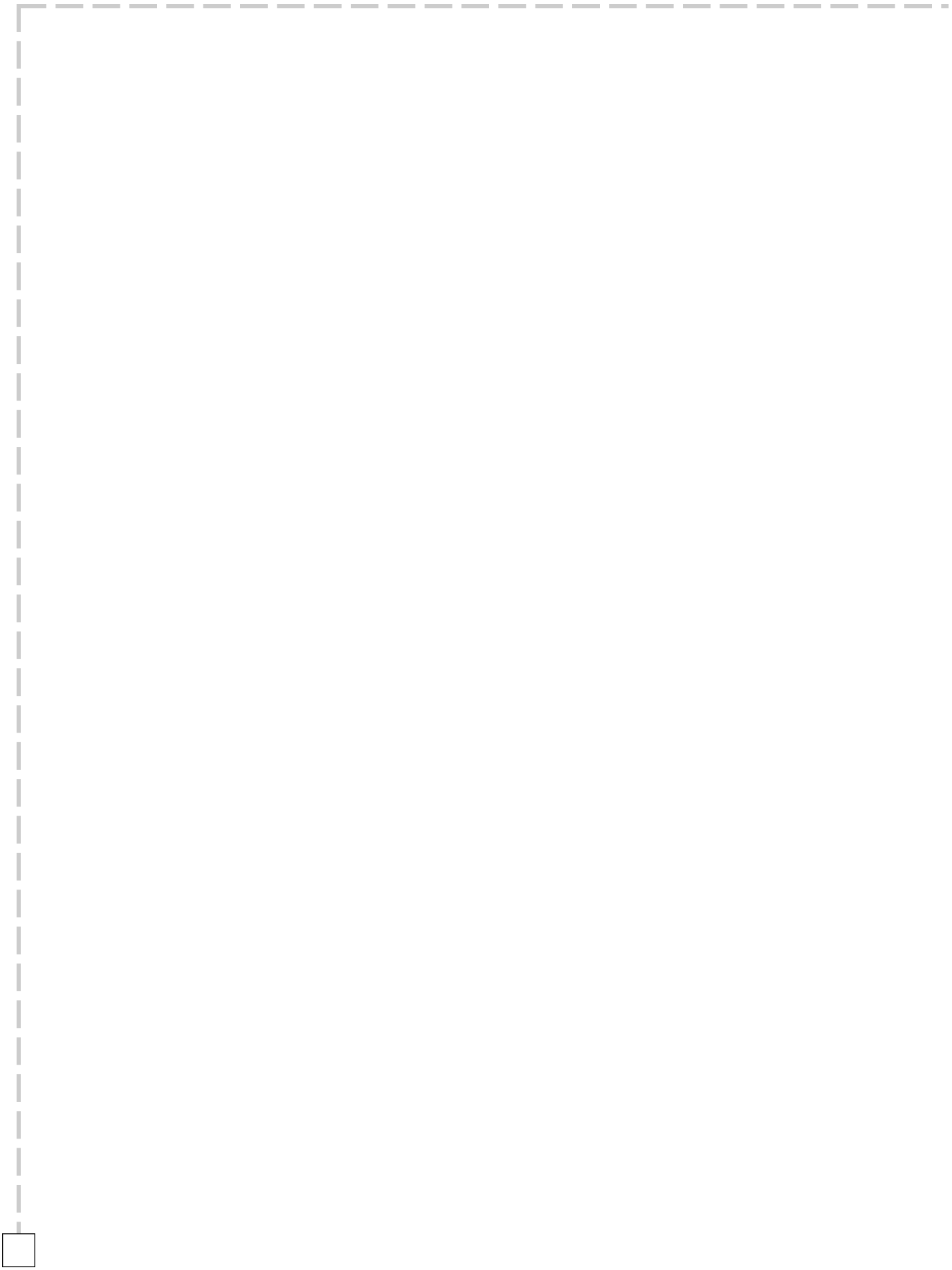
The Partnership for Advancing Technology in Housing (PA

The objective of PATH technology roadmap-

Coordination of the work of these independent subcontractors is very difficult. Most of the construction is performed at the job site where the process and the materials are subjected to the vagaries of weather. Weather delays ripple through the numerous subcontractors resulting in rescheduling nightmares. Theft and vandalism are two other ever-present problems that result not only in the cost of replacing the materials, but also in schedule slips and complex rescheduling. In short, the home building process is inherently difficult to control.







OVERVIEW

Five strategies for positively affecting *Whole House and Building Process Redesign* were agreed upon and are detailed below. The first two are not technology research and development projects. They are strategies for proactively dealing with two issues that are well known and frequently lamented in the home

1 MANAGE THE CHANGE PROCESS: ACCELERATE ACCEPTANCE OF INNOVATIVE HOME BUILDING TECHNOLOGIES

A theme repeated many times at the roadmapping session, and generally across the home building industry, is that we need, but are very deficient in, system thinking. System thinking addresses the overall design as well as selection and

of options that would allow builders to mix and match elements of technology ranging from purely stick-built to completely modularized.

The steps involved in this process would include:

Industrialization of home building has two important goals. The first is to improve the efficiency with which the home is built. As depicted by the curves on the left in Figure 3, production or factory-built homes typically are built with more efficiency than site-built, custom homes and therefore have less need for improvement. The second goal is to improve flexibility of changing home designs to suit customers' needs. In this case, custom homes already have quite

The Roadmap for implementing this strategy is shown in Figure 4 and described below.

3.1 Apply Manufacturing Processes to Home Building

Adapt and apply manufacturing processes that have been successfully used in other industries to the process of home building. Address factory-built, modular, panelized, and stick-built homes.

A study performed by Virginia Tech for HUD, “Industrializing the Residential Construction Site” (O’Brien, Wakefield, and Beliveau, July 2000), provides an excellent overview of what is going on in the home building industry in the United States and abroad, as well as manufacturing concepts successfully used in other industries.

Industrialization concepts that have worked in other industries and that currently may be in use by on eld,lI1e3 w009 -20.1ave ion4ey o233 5ing3I -21lly -0.132 -12.5 Tclude:e Buil5 f BT /F2.89

The activities discussed below represent important steps in the industrialization of the home building process.

It will first be necessary to establish linkages with the Intelligent Manufacturing Systems (IMS) organization through the Innovative and Intelligent Factory Construction project. This project focuses on applying IT and robotics to construction. Also, the International Association for Automation and Robotics

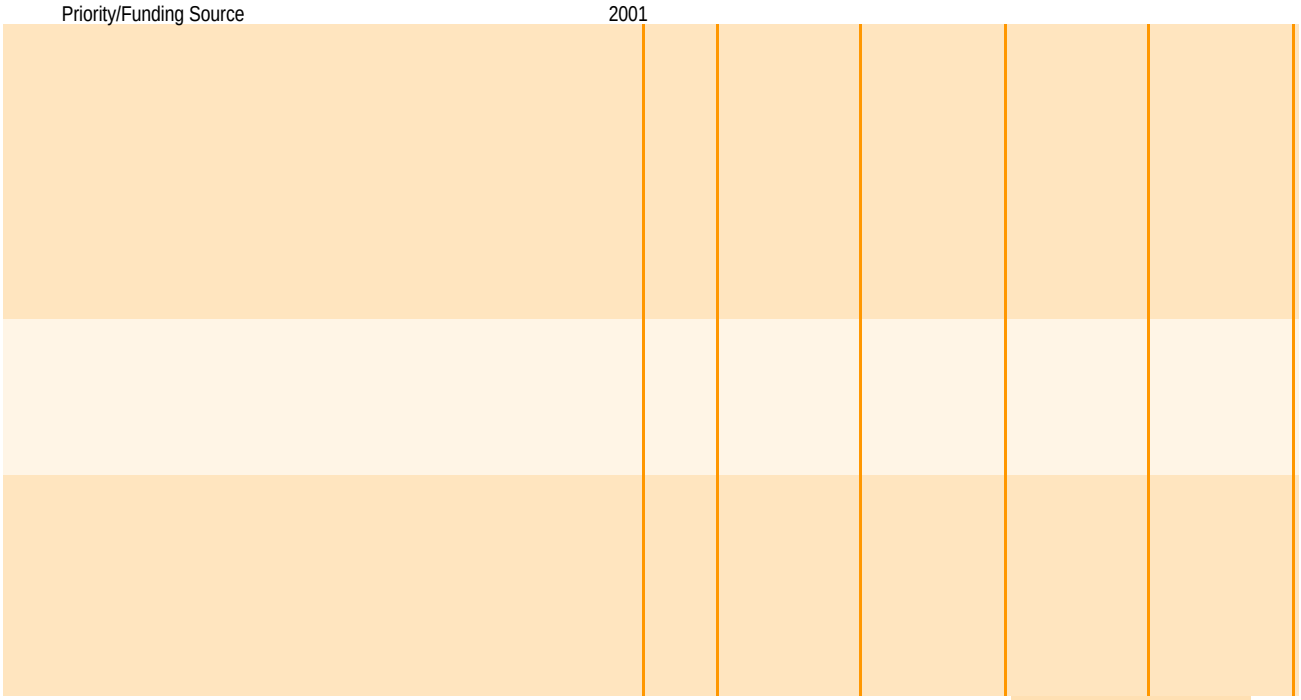
Houses today are designed pretty much the way they were in the 19th century

HVAC distribution, surface wiring, or surface raceways for wiring. Another

Figure 5

5.1

5. Move More of the Home Building Process into the Factory



Key: Priority: L, M, H = Low, Medium, High
Funding Sources: G, P, C = Government (public), Private Industry, Combination
Funding amounts are approximations.

Figure 6