

Designing recovery systems for participation and material quality

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Recovery systems are often described by how material is collected. In practice, performance is shaped earlier, at the point of deposit. Two questions matter most: can people participate easily, and is material quality protected at source? When either breaks down, recovery systems become difficult to manage and difficult to scale. Better performance comes from designing access and control together.

Start by balancing access and control

Recovery systems need to make participation easy while protecting material quality. Too much openness can increase contamination and misuse. Too much restriction can reduce participation. Consistent performance depends on balancing both.

That balance is not theoretical. It determines whether people actually use the system and whether the material collected remains usable once they do.

What high-performing recovery systems have in common

Participation improves when access is easy. Material quality improves when deposit is structured and controlled. Better recovery systems usually combine four qualities.

- **Accessible participation**
Sites are easy to reach and fit into everyday routines.
- **Controlled deposit**
The infrastructure protects material quality at the point of use.
- **Clear use**
It is obvious how the system should be used and what belongs where.
- **Operational stability**
The system can be serviced, maintained, and scaled without degrading.

Choose the recovery model that fits the setting

The right system is the one that fits the setting, not the one that looks best in theory. Before specifying infrastructure, define the operating model.

- **Curbside collection**
Best suited to lower-density housing and areas where collection logistics are practical, but often more expensive and less suitable in dense or multifamily environments.
- **Drop-off systems**
Best suited to locations where curbside is not viable or economical, and where flexible access matters more than door-to-door service.
- **Hybrid systems**
Often the most stable long-term model, combining curbside where it works well with drop-off where shared access and flexibility matter more.

Place sites where participation can actually happen

Performance depends on how well the system fits everyday use. Effective sites are located along existing travel routes, close to where target users live or move, visible without being overly exposed, and distributed to support equitable access. Poor siting usually leads to low participation, contamination, misuse, or underused assets.

The level of access control also needs to fit the setting. Open systems may work in lower-pressure locations, while more exposed or contamination-sensitive environments often need a higher level of structure and accountability.



Specify infrastructure that protects quality at source

Deposit points should guide correct use, reduce ambiguity, and help prevent cross-contamination. Aperture size and shape matter because they influence what can be deposited and how easily.

Infrastructure should also provide enclosed construction, pest resistance, weather protection, and durability under repeated public use. At the same time, it needs to remain practical for crews to service, easy to clean, and suited to the operating demands of the wider program. The aim is not simply to hold material, but to shape participation and protect output quality at source.

Run a five-minute check before you scale

Start with one question: Where does this system fail to balance access and control? Then check five areas:

- 1. Access**
Is participation easy and consistent for intended users?
- 2. Material quality**
Is the stream protected at the point of deposit?
- 3. Clarity**
Is it obvious how the site should be used?
- 4. Output quality**
Are materials remaining consistently usable?
- 5. Scalability**
Can the system expand without degrading?

This usually reveals whether the recovery model is ready for broader rollout.

Structure operations around what the system is showing you

Operations need to support system performance. That means aligning servicing with actual usage, prioritizing high-use locations, tracking participation and contamination patterns, and adjusting siting, access, or servicing where needed. Better systems are not static. They improve when operators use what the infrastructure is showing them to refine the program over time.



Scale in stages, not all at once

Most successful recovery systems scale in stages. A common pattern is to pilot in selected locations, refine based on observed results, expand incrementally, and then integrate with wider recovery infrastructure.

Trying to scale too early usually weakens performance. The stronger approach is to learn from real use, improve the model, and then extend it with confidence.

Move from collection thinking to system design

Recovery performance improves when systems are designed to enable participation, protect material quality, and perform consistently as usage grows.

The key question is not only how material will be collected. It is how the system will make good participation easy and maintain quality at source.

Looking to improve recovery performance across your network?

We work with municipalities, housing providers, and operators to design systems that improve participation, protect material quality, and support scalable recovery.