

MODULE 6: ASSESSING THE POTENTIAL TRANSFERABILITY OF THE INNOVATION

The purpose of this module is to provide information on an innovation to help reduce the uncertainty about its expected consequences and determine its rate of adoption. In 1962, Everett Rogers wrote the pioneering work, *Diffusion of Innovations*¹, which presents a workable framework for diffusing innovations or innovative thoughts over time. Rogers' work provides a systematic approach to understanding the nature of innovations and the existing conditions and culture necessary for accepting, adopting and implementing innovations.

In assessing the potential transferability of an innovation, practitioners should consider a set of overview questions, followed by a ranking methodology based on Roger's innovation-diffusion model and a sample application of the transferability module. It is recommended that practitioners first read through the questions and ranking methodology to understand the approach and how these two steps work together. Some of the overview questions will also be addressed in the ranking process and the ranking will inform responses to the overview questions. This transferability module is based on Rogers' innovation-diffusion model, which has five components: 1) relative advantage; 2) compatibility; 3) complexity; 4) trialability; and 5) observability. This module provides a definition of each component as it relates to environmental innovation and key questions related to each component.

I. *Relative Advantage* is the degree to which an innovation is perceived as being better than the idea it supersedes. The degree of relative advantage is often expressed as enhanced environmental protection, reduced risk to public health, costs savings in meeting regulatory requirements, recognition for being an environmental leader, administrative streamlining, increased public involvement, or other benefits over the traditional approach.

Within this component, it is also important to identify who benefits from the innovation(s). If all parties to the innovation including the regulated community, the public, and Federal and State environmental regulators benefit from the innovation, the relative advantage is easier to ascertain. If, however, regulated entities perceive a relative advantage while the public perceives a disadvantage, the innovation may need to be better communicated to the public and stakeholders or it may need modification prior to scale-up.

A final question regarding the relative advantage component is whether additional data is needed to inform this determination. If additional information is required prior to making this assessment, it may be necessary to go back and re-check the module on *Assessing the Environmental Results of the Innovation* to see where there are data gaps in data collection or methodology. It is often the case that more complete information is necessary to make a determination of the potential for broad-scale application of the innovation.

1. Compared to the traditional way of doing business, what has been the measurable impact (positive and/or negative) of the innovation with regard to:
 - a. Environmental protection
 - b. Organizational management
 - c. Economic impacts
 - d. Expedited action
 - e. Public involvement
 - f. Accountability
 - g. Environmental justice

¹Rogers, E. *Diffusion of Innovations*. 4th Edition. The Free Press, New York: 1995.

- h. Administrative burden
 - i. Other areas
2. Who benefits from the innovation(s)?
 - a. What do they gain?
 3. Who incurs costs as a result of the innovation?
 - a. What costs do they incur?
 4. What additional data are necessary to inform determination of the relative advantage of the innovation?

II. *Compatibility* is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. The innovation practitioner should assess how well the innovation is consistent with organizational needs and goals. This module asks the practitioner to look at the feasibility to adopt an innovation given the “culture” of those who are affected by the innovation, the users of the innovation, or the perceivers of the innovation.

As in the relative advantage component, it is important to assess the innovation’s compatibility with the multiple organizations that participate, or may be interested in participating, in the innovation. For example, compatibility with the culture of the regulated entity is as important as compatibility with the culture of the environmental regulators. If the innovation is embraced by the regulated community, and rejected by the regulators, the innovation is unlikely to be adopted. It is also possible that an innovation may be embraced at the Federal level and not at the State or local levels for a variety of reasons that may, or may not, have to do with the innovation itself, but with the availability of resources.

5. To what extent is the innovation consistent with existing organizational beliefs, values, and/or management approaches?
6. What is the level of support for the innovation from:
 - a. Within EPA
 - b. The affected entity or entities
 - c. Other regulated entities
 - d. State agencies
 - e. Federal agencies
 - f. Local community
 - g. Environmental NGOs
 - h. Environmental Justice groups
 - i. Local government
7. To what extent has a similar innovation been tested before?
 - a. Different sector or industry
 - b. Different media
 - c. Different state, EPA Region, local government, Tribe
 - d. Different community
8. Among existing practitioners, to what extent does the innovation support organizational goals, (i.e., department, office or divisional goals, community goals)?
9. Among existing practitioners, to what extent are organizational changes necessary to enable widespread use of the innovation (what specific changes are necessary)?
10. Among potential practitioners, to what extent does a broader user market or audience exist for the innovation?
11. Among potential practitioners, to what extent does the innovation need modifications to be used more broadly (what specific changes are necessary)?
12. Who else might use or be interested in the innovation (e.g., regulated entities not originally contemplated as practitioners of the innovation, or regulators who might be able to transform the innovation in a creative way for other purposes)?
 - a. Other regulated entities
 - b. Other regulators (Tribes, local, State, EPA Regions, EPA Headquarters)
 - c. Communities

III. *Ease of Adoption* is the degree to which an innovation is perceived as relatively easy to understand and use. If the innovation is complex, the development of assistance materials to assist adoption may be considered. Or, if the innovation has been tested before in a different sector, media, governmental entity, or community, are there existing users that would be willing to provide testimonials, or existing materials that might prove helpful?

13. How readily understood is the innovation?
14. To what extent is assistance necessary, and available, to understand and use the innovation?
15. If the innovation needs to be brokered, what assistance products are available?
 - a. Are in development
 - b. Need to be created

IV. *Trialability* is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried in a phased approach are generally adopted more rapidly than innovations that are not easily implemented in stages. The innovation practitioner should identify, to the extent feasible, how the innovation might be divisible, and in what sequence, to solicit feedback for this component.

16. To what extent can the innovation be tried on a temporary basis (i.e., one month, one year, etc.)?
17. To what extent can the innovation be tried on a limited scale (i.e., fewer facilities initially or with fewer regulatory authorities)?

V. *Observability* is the degree to which the results of an innovation are visible to potential practitioners of the innovation. If the innovation is targeted at a small group of technical experts, dissemination of the idea in a trade journal may be adequate, whereas an innovation that affects a watershed will need a different strategy to assure optimal visibility and broad-scale adoption.

18. To what extent are innovation results apparent to others?

VI. Personal Experience and Observations

These overview questions are for the lead innovator and other key players. They ask fundamental questions that must be addressed in any assessment of transferability potential, including whether the innovation represents an improvement, whether it is ready for diffusion, what the primary drivers and barriers are to scale-up, how to best implement the innovation, and at what organizational level?

19. To what extent do you consider the innovation to be an improvement over the traditional way of doing business? In what way(s) was the innovation an improvement?
20. Is the innovation old enough to have a full understanding of its advantages and disadvantages?
 - a. If not, when will it be possible to gain a full understanding of the advantages and disadvantages of the innovation?
21. What are the primary lessons learned from testing and analyzing the innovation that pertain to its broad-scale application?
22. What is the potential for broader application of the innovation?
 - a. Could the innovation be used to address another problem?
23. What are the primary barriers to broader application of the innovation?
24. What are the critical implementation elements needed to overcome the barriers to broader application of the innovation?
25. In your judgment, how would the innovation best be applied?
 - a. What steps could be taken to facilitate more widespread application of the innovation?
 - b. What steps could reduce the transaction costs of the diffusion?
 - c. What elements should be scaled-up
 - d. What elements should be changed?
 - e. How might other practitioners be identified?

Are there unique circumstances that could impact broader application of the innovation (e.g., window of opportunity)?

26. Are there resource limitation, if any, which would constrain broad-scale application?
27. At what level – national, State, or local – should the innovation be applied?
 - a. What are the appropriate mechanisms for such application?

VII. Innovation-Diffusion Model: Using a Transferability Scale

By assessing the potential transferability of an innovation by the five diffusion components, the innovation practitioner will be able to better identify candidates for broad-scale application. Those innovations with high scores on all or more diffusion components are likely to be better candidates for broad-scale application than those innovations with low scores. This ranking methodology should provide the innovation team with insights into the potential transferability of an innovation, but it will not substitute for the judgment of experienced practitioners and it does not guarantee the predicted results. Innovations can take a life of their own despite best predictions. For example, an innovation that ranks as a “low” on the transferability scale may be able to be scaled-up due to unanticipated events. The converse is true for those innovations that may seem to be highly transferable, and may end up sidelined in the end. The ranking table should be used to emphasize the strengths of the innovation and to continue to improve on the weaknesses in order to help transfer the innovation. The table can also be used to help identify priority innovations for scale-up. If the practitioner has multiple innovations, but limited resources, the ranking table can help assist decisions to scale-up those innovations which are highly transferable first.

Relative Advantage: If an innovation is perceived, when compared to the traditional way of doing business, as resulting in significant environmental benefits and cost savings, it would be ranked as high on the transferability scale for this component. Conversely, if the innovation yields environmental results that are no better than the traditional approach and the costs are increased, it would be ranked as low for the relative advantage component.

A more difficult case is when environmental results are superior, but costs are significantly increased. In this case, the innovation practitioner may want to identify the benefits that are being ranked (i.e., rank the relative advantage for environmental results as high and the relative advantage for costs as low). Or, the practitioner may choose the “moderate” rank to reflect the competing considerations. In either case, the practitioner is advised to explain the rankings so that the rationale is transparent to other members of the innovation team.

Compatibility: An initial ranking regarding compatibility should begin with the existing practitioners of the innovation, and then address compatibility of the innovation with potential adopters. Existing practitioners and, to the extent feasible, potential adopters should be consulted to ascertain whether the innovation is, or is likely to be, consistent with organizational beliefs and management approaches. If not, are there specific changes that would make the innovation more compatible? Again, if there are differences in the compatibility rankings among the cultures of participants in the innovation, or between existing users and potential users, the innovation practitioner should note these differences and provide explanations, if possible. The practitioner should use these differences to honestly assess how feasible adoption of the innovation will be, and how to communicate differently with parties to address cultural differences.

Ease of Adoption: An innovation will be ranked high on the ease of adoption component if potential adopters readily understand it and little assistance is needed to use the innovation. If the innovation is complex, difficult to understand, and requires considerable assistance to inform adoption of the innovation, the innovation will be ranked low on the ease of adoption component.

Trialability: For this diffusion component, a high ranking means that the innovation may be tested on a temporary basis, or on a limited scale, before being fully adopted. A low ranking would indicate that the innovation must be tried with a large number of facilities or over a significant period of time in order to see results, implying that significant and sustained resources (e.g., capital, personnel) are required to diffuse the innovation.

Observability: A high ranking means that the innovation is very visible to the targeted practitioners and a low ranking means that greater efforts will need to be made to increase the innovation’s visibility.

Exhibit 5—Transferability Scale			
Innovation-Diffusion Components	High	Moderate	Low
Relative Advantage			
Compatibility			
Ease of Adoption¹			
Trialability			
Observability			

¹ For ease of adoption, “high” responses are positively related to an innovation’s rate of adoption, whereas “low” responses are negatively related. For trialability, “high” responses are positively related.