

POLICY SERIES



Getting a Better Bang for the Pothole Buck

Applying Best Local Government Practices to Municipal Infrastructure Funding

By Larry N. Mitchell
and David Seymour

About the Authors



Larry N. Mitchell, Senior Fellow, is a New Zealander though a Canadian by birth. He has over 30 years active experience of commerce, chartered accounting and since the mid-nineties an immersion in local government finance and policy practice. He services the New Zealand local government sector with extensive financial and policy advice primarily through his "Base Stats with Trendz" statistical reports to over 30 New Zealand Councils. Larry is working with the Frontier Centre to lead, develop and deliver the Canadian Local Government Index a major initiative designed to assist with performance improvements of the Canadian local government sector. Larry graduated B Com, (Auckland University) in 1967. He served as a pilot in the RNZAF before taking up public accountancy practice. Following over twenty years experience as a partner in Coopers and Lybrand's Auckland office in 1996 he graduated Master of Public Policy (Victoria University) majoring in public sector finance. He operates his own international local government consultancy business from Puhoi, 40 km north of Auckland, New Zealand.



David Seymour, Senior Policy Analyst, and Director of our Saskatchewan Office, joins the Frontier Centre from New Zealand. He holds degrees in Electrical Engineering and Philosophy from the University of Auckland, where he also taught economics. After working as an engineer in New Zealand he is applying his passion for high performance government to policy issues on the prairies. In his first year working for the Frontier Centre David has carried out extensive media work, presenting policy analysis through local and national television, newspapers, and radio. His policy columns have been published in the *Winnipeg Free Press*, *Regina Leader Post*, *Saskatoon Star Phoenix*, *Calgary Herald*, *Edmonton Journal*, *Windsor Star*, *Nova Scotia Herald* and the *National Post*. David has produced policy research papers in the areas of Telecommunications Privatization, Education, Environmental Science, Housing, Anti Poverty Policy and Fiscal Policy. However, his major project with the Frontier Centre is the *Local Government Performance Index* (LGPI). The second annual LGPI was released in November 2008, at a time when municipal accounting standards in Canada must be improved if the municipal government sector is to reach its potential as an economic growth engine for Canada.



MB: 203-2727 Portage Avenue,
Winnipeg, Manitoba Canada R3J 0R2
Tel: 204 957-1567 Fax: 204 957-1570

SK: 2353 McIntyre Street,
Regina, Saskatchewan Canada S4P 2S3
Tel: 306 352-2915 Fax: 306 352-2938

AB: Ste. 2000 – 444 5th Avenue SW
Calgary, Alberta Canada T2P 2T8
Tel: 403 230-2435

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By Larry N. Mitchell
Senior Fellow

and David Seymour
Senior Policy Analyst

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The Frontier Centre for Public Policy is an independent, non-profit organization that undertakes research and education in support of economic growth and social outcomes that will enhance the quality of life in our communities. Through a variety of publications and public forums, the Centre explores policy innovations required to make the prairies region a winner in the open economy. It also provides new insights into solving important issues facing our cities, towns and provinces. These include improving the performance of public expenditures in important areas like local government, education, health and social policy. The authors of this study has worked independently and the opinions expressed are therefore his own, and do not necessarily reflect the opinions of the board of the Frontier Centre for Public Policy.

Executive Summary

- Rural Canadian municipalities represent a very small proportion of total provincial population numbers compared with urban ones, but they extend over huge areas and service small rural communities.
 - Many rural municipalities spend large sums on transportation infrastructure. Compared with urban municipalities, a much greater proportion of their expenditures goes to infrastructure.
 - Roads are either public or private goods depending on the volume of usage and its impact. For relatively low-impact usage such as that of private motor vehicles, roads can be treated as a public good. For high-impact usage such as heavy trade vehicles, they are best viewed as a private good.
 - The public/private good distinction is useful for deciding whether collectivized funding (taxes) or private funding (user fees) is the most efficient.
 - For those cases suited to private funding, user fees (road taxes) are the preferred funding mechanism, as the alternatives do not share the simplicity and direct cost-benefit relationships that road taxes provide.
 - Some local governments in other countries target the recovery of their transportation infrastructure costs by taking account of user-pay principles targeted at exceptional users.
 - Currently, Canadian road funding does not universally adopt user-pays practices in cases where road maintenance costs arise from identifiable exacerbator sources.
- Note; the word *exacerbator* though not in general use in Canada has become vernacular in local government circles. It could be replaced with the words *exceptional user*.
- The user-pays principle should be extended to certain sectors and industries that create heavy-traffic road damage and that impose exceptional infrastructure maintenance costs.
 - Consideration should be given to extending the principle more widely to municipal revenue-raising mechanisms including an increased share of road-user taxes. For such funding to be granted, this policy can be made conditional upon municipalities demonstrating appropriate management and information relating to road conditions and maintenance requirements; that will include a full identification and measurement of road condition expenditures thereby justifying their means of funding.
 - The establishment of robust asset-management process and plans for municipalities is a priority in any event throughout the sector. This process should also become a pre-condition for the production of the data necessary to establish the costs of heavy-vehicle road damage, which in turn can lead to the recovery of costs with more comprehensive user-pays mechanisms.
 - Legislation that empowers municipalities is needed to mandate the asset and financial management and other legal and policy issues associated with an improved roads funding regime.

- While most of the measurements quoted in this paper apply to the province of Manitoba and include Manitoba-based statistics for population, municipal expenditures and roads, they are likely to be applicable to the other Prairie provinces and sparsely populated areas of Canada. In one recently reported case, many of the

recommendations of this paper were acted upon already involving special additional road maintenance charging of exceptional users. A start has been made; it is now time to ensure that proper process legal and policy settings are put in place to support these initiatives.

Introduction

The costs associated with roads, bridges and roadsides of rural municipalities and the means of their funding are matters of considerable policy and economic significance.

An appreciation of the size of Canada's rural population is important for an appraisal of their transportation infrastructure services. Local roads, supported by a range of subsidies, are principally funded by a large number of very small units of local government with populations below 5,000 residents.

The *diseconomies* of scale created by high transportation infrastructure requirements and small municipal tax bases as well as the use of public roads by outside entities for private benefit have an adverse effect upon transportation infrastructure costs: Few people are available to pay for the roads, but they may still be widely used. Consequently, the funding mechanisms for rural roads are matters worthy of careful consideration.

The funding of roads in the rural municipalities has been the subject of considerable debate in Canada over the past several years. A complication is that additional costs are generated when an area's roads are heavily used for operations that are not contained within its boundaries. There are many examples of these costs that arise from mining and petroleum operations conducted in remote areas but managed and financed by distant commercial firms.

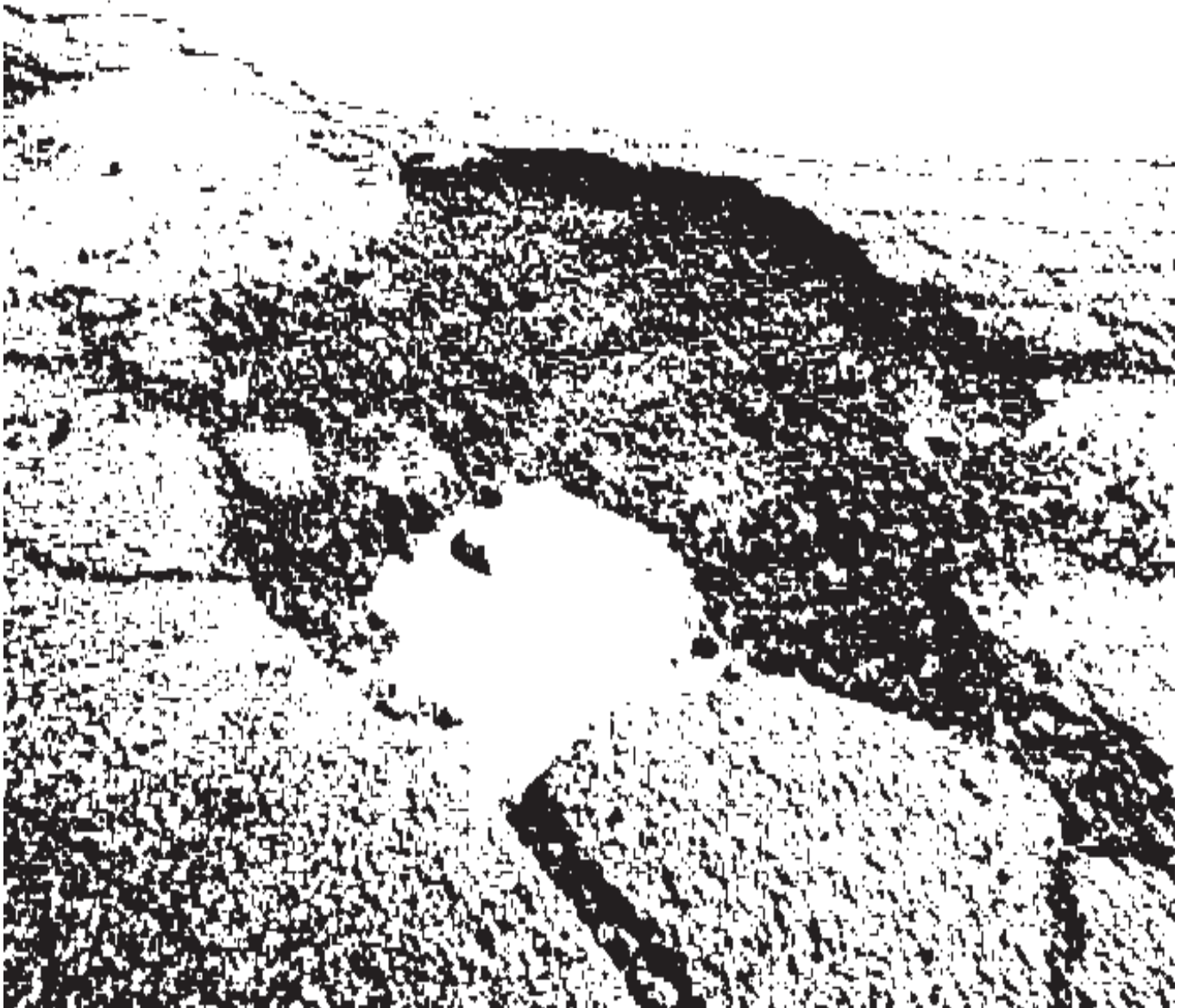
Rural municipalities and organizations such as the Saskatchewan Association of Rural Municipalities (SARM) appear to favour funding roads by higher levels of government and by taxation.

However, in other parts of the world, rural government jurisdictions faced similar challenges and responded by charging users in proportion to the exceptional—the supernormal—damage they cause. This is the exceptional user-pays or exacerbator-pays principle.

Canada can simplify the existing complex web of intergovernmental subsidies and the political wrangling that results and replace it with the exacerbator-pays principle at the local level.

These jurisdictions employ asset-management schemes that incorporate engineering-based information on road costs to calculate and justify the recovery of the costs imposed by major operators. They integrate accounting and engineering activities to create a pricing schedule for heavy road use. Canada can simplify the existing

complex web of intergovernmental subsidies and political wrangling that results by introducing the exacerbator-pays principle at the local level. Subsidies would decrease and be largely replaced with user-pays taxation policies that recognize the obligation of the exceptional user to pay for the costs incurred.



Good information can make out a case for, and quantify amounts when seeking reimbursement for damage to roads...

Rural Municipality Transportation Infrastructure Dynamics

Rural municipalities represent a small proportion of total provincial population numbers compared to urban areas, but they service large areas; such areas often contain large numbers of local government units that service the rural communities. The rural municipalities thus administer and support a huge network of local transportation infrastructure.

At present, the ubiquitous means of funding of rural roads relies on high levels of subsidies that are determined by governments and bureaucracies distant from the areas of benefit and therefore less in touch with local road circumstances. Subsidies would continue to play their part in road funding, but they should follow certain rules: The “correct” ratio of local and higher governmental funding should be proportional to the benefits that accrue from the road-using activities in these jurisdictions. In reality, of course, there is constant political tension over which level of government should pay for what.

On the Prairies, the rural municipalities form the backbone of service delivery to agriculturally based communities. The huge geographical areas administered by them comprise, in a typical case such as Manitoba, 99.6 per cent of the province’s open space, but these areas are home to a mere 19 per cent of the province’s population.¹

The number of local government jurisdictions in Manitoba with fewer than 5,000 residents totals 188 or 95 per cent of the 198 units of local government. The City of Winnipeg plus another 10 urban municipalities of more than 5,000 residents make up the balance.²

Rural roads are subsidized by higher levels of government. The subsidies give rise to debates over what the correct mixture of revenue and cost sharing should be. Good asset-management information derived from the proper administration of rural road is essential and would then be available to use in decisions as to what type of cost sharing is justified. This paper argues that good information can justify reimbursements for damage to roads arising from heavy road use, and quantify amounts recoverable.

We particularly subscribe in this context to the principle so clearly expounded by Trent University’s Harry Kitchen: “[M]unicipal infrastructure should be financed as far as possible by the residents who benefit from it because this provides the surest guide to how much should be invested in what.”³

A great deal of road funding relies on higher levels of government and thus suffers from the problem that investment in roads is not as direct as Kitchen would wish. Such a model is not as accountable and transparent as would be a model connecting local expenditures with locally sourced tax revenue.

An economic boom in one remote region ... will increase the occurrence of exceptional road damage with the inevitable impact reflected in higher costs...

The Pattern of Transportation Infrastructure Expenditures

There are large numbers of rural municipalities in Canada, and they spend large sums on transportation infrastructure. They spend a much greater proportion of their total expenditures on their roads than do urban entities.

Expenditures on their roads are invariably Rural Municipalities' largest single expenditure. On average, transportation infrastructure accounts for around 40 per cent of rural municipalities' annual expenditure totals. Urban municipalities spend only 17 per cent on average and the City of Winnipeg spends 24 per cent on its roads. The smaller rural municipalities spend proportionately more on transportation infrastructure (at 43 per cent) than do the larger ones (34 per cent).⁴

After transportation infrastructure, the next highest municipal expenditure is administration, which comprises 18 per cent of rural municipalities' expenditures. Within the aggregated municipal general operating fund, transportation infrastructure costs come to 27 per cent of all provincial local government (city and rural) expenditures.⁵

Rural municipalities' transportation infrastructure costs account for 24 per cent of their aggregated expenditure provincial total. On a per capita basis (2001 census), rural municipalities' transportation infrastructure expenditures per person were \$312 annually while urban municipalities spent \$293.⁶

It is clear from this data that transportation infrastructure is big business, often almost the only business of smaller rural municipalities. The status of transportation infrastructure in this hierarchy, as is the case the world over for rural areas, reflects the importance these often remote communities place upon their local roads.

Abnormal periodic events or exceptional circumstances that increase transportation infrastructure costs—an economic boom in one remote region such as a new mine or Alberta's oil sands—will significantly increase heavy road use. It will increase the occurrence of exceptional road damage with the inevitable impact reflected in higher costs for engineering determined highway maintenance, renewals⁷ and new road construction.

Rural municipalities' transportation infrastructure costs are extremely sensitive to these events and are always material to rural municipalities in financial terms. So, too, are the policy and financial issues surrounding the means by which these costs can be financed.

There are significant problems associated with measuring the utility that residents extract from roads...

The Funding of Transportation Infrastructure Expenditures

The funding mechanisms by which communities can raise revenue for their roads are a broad field that delves into public good theory. Public goods have two characteristics; they are non rivalrous and non excludable;

1. It is difficult to extract direct payment from the beneficiaries of the good. In these cases, the good is produced only if payment can be collected through other means, usually taxation. Goods with this characteristic are called non-excludable.
2. One person's usage does not diminish the usage possibilities for other users or potential users. Goods with this characteristic are described as non-rivalrous.

In an ideal world, roads would be treated as a rivalrous and excludable private good wherein the beneficiaries pay directly for the benefit they extract. Such a system would have the advantage of sending clear price signals between producers and consumers regarding the level of resources that should be directed toward the production (and in this case the maintenance) of the good and the true cost of using it. However, there are significant problems associated with measuring the utility that residents extract from roads. Moreover, they tend to be non-rivalrous when used by light vehicle users under conditions of low or no congestion.

Therefore, roads under general usage fit the characteristics of public goods.

However this paper focuses on exceptional circumstances where they are rivalrous and excludable, so can be treated as private goods.

For one example of rivalry in roads, some jurisdictions like London (England) recognize that congestion diminishes the utility that each additional vehicle gets from a road and impose congestion charges to limit that rivalrous activity. While congestion is seldom a problem for road users in rural settings, an issue exists when exceptional heavy-vehicle movements bring about road damage. When certain categories of heavy users damage rural roads and reduce the road quality for other users, their usage can be viewed as rivalrous.

The question of whether roads are excludable is more complex. Some hold the view that roads create externalities—that is, consequences where people can benefit from the roads without necessarily using them. For example, a private business is aided by the ability of its trading partners to use a particular road to quickly and easily access the business. For cases like this, it is extremely difficult to quantify the utility people gain from the use of roads, and therefore it is difficult to charge them for it.

While the above problems with measuring the benefits different people extract from roads mean that they are non excludable and therefore best treated as a public good

The problem of collecting payment for road use is essentially a technological one, but it has implications for civil liberties...



with respect to general usage, particularly heavy users are easier to exclude because there are fewer of them and their activities are easier to monitor.

This paper will discuss an appropriate basis for a number of funding alternatives by considering two cases.

- The recovery of normal transportation infrastructure operational costs, where roads can be viewed as a public good.
- The case for special treatment for the funding of exceptional transportation infrastructure costs, where roads can be viewed as a private good.

A light vehicle user extracts benefits that are small compared to the cost of monitoring their activity.

The User-Pays Principle for Rural Transportation Infrastructure Costs

It is important to note that, for many local governments, there is nothing revolutionary about a user-pays cost-recovery mechanism. Rural municipalities already use it. Examples include regulatory fees and wastewater charges.

In the case of the more general use of roads (by lighter vehicles driven by local residents), the criteria for user charges are barely met. A light vehicle user extracts benefits that are small compared to the cost of monitoring their activity. Such monitoring may also come with undesirable incursions into privacy.

However, Rural Municipalities already apply *de facto* user charges for roads in the form of property taxes that are loosely correlated with usage. This contention arises from consideration of the following set of prevailing circumstances:

- Farmers make up the majority of rural populations.
- Farmers generally accept that their local roads are essential for conducting their private farming activities.
- There is a relatively direct equivalence of the transportation infrastructure content of local taxation revenue to expenditures on local roads. Due to the small size of rural municipalities, farmers can see and account for transportation infrastructure operations set alongside the amounts they pay (are taxed) for these services. Farmers tend to elect councilors who are accountable and who can represent their

interests and make rational and informed value for money assessments at both the local grassroots and the municipality organizational level.

- Well over 50 per cent of rural municipalities' total costs are attributable to their roads, as these assets are their core competency-business specialization.⁸ Based on these facts, farmers pay the lion's share of their property taxes to finance the benefits of the transportation infrastructure services they receive. In effect, an existing road's cost recovery is no different from a user-pays charge, so a *de facto* user charge is already in place.
- Granted, the benefits of road use and the incidence of the associated costs may vary from farmer to farmer and are dependent upon various taxation ratings against property and or capital values. The principle of charging the user is not materially or unfairly affected by these somewhat pragmatic apportionment decisions.
- The consequences of these circumstances will render less revolutionary the suggestion that heavy exceptional road use be made more user (exacerbator) pays.

In normal local government circumstances, the exceptional-user pays principle can be viewed as a direct extension of the user-pays approach. User-pays principles can be practically implemented given precise identification of the cost drivers that link service provision to the factors that

created the costs. This will often suggest and then provide a direct connection to a suitable mechanism for charging the identifiable person or persons or, of more application to this paper, the sector or industry responsible for the costs.

For example, there is little debate in local government circles about directly charging identified industries for the costs associated with their harmful waste disposal.

The user-pays or exacerbator-pays principle can be used to recover transportation infrastructure costs, particularly the occasional heavy use of rural roads.



The distinction of users is important based on both their local character and their normal contemplated levels of daily and yearly road use.

Sector-Specific Transportation Infrastructure Costs and User-Pays Taxation

Some local government cost-recovery models take account of user pays for specific uses and they are based upon so-termed exacerbator principle. The exacerbator-pays concept is a variation of the user-pay philosophy associated with recovery of the costs arising from specific actions taken by a user, in this case targeted at exacerbators.

While general vehicle use does not appear to meet the criteria for user-pays funding due to the low extracted benefits and high transaction costs, it is possible that some more concentrated heavy uses might.

In certain cases, it may be possible to identify users who impose a heavy cost on transportation infrastructure and whose usage is relatively easy to monitor. Exceptional costs for roads often arise from short-term heavy usage by commercial sectors. These are usually confined to certain industries—logging, mining, quarrying and oil exploration, for example. All of these activities impose “supernormal” costs upon many rural municipalities.

Certain industries escape paying for the heavy costs they impose. In these cases, as exacerbator of costs, their road use is more akin to a private rather than a public good. Provision of the (road) service is rivalrous, because the damage they do to roads clearly reduces the utility available to other users or potential users. Heavy and damaging road use can be charged to certain users if a user-pays mechanism

that is accurate and justifiable can be found and if the transaction costs are small compared to the variations in charges payable by different users.

If a charging regime is to be used, it is important to contrast normal road use with *abnormal*, heavy use. For example, Canadian grain-harvesting activities, albeit “heavy”, are often accepted as routine and acceptable given that it is the farmers who pay for a major part of the road system: Rural municipalities’ roads are designed and built to withstand the typical axle loads of grain and livestock transportation. Though the loads are often heavy, they are tolerable by design. Normal road-maintenance programs and budgets provide for these unexceptional traffic volumes and weight loads.

This position should not be construed as favouring any particular road user such as local farmers. The distinction of users is important based on both their local character and their normal contemplated levels of daily and yearly road use. Other users not meeting these two criteria should be singled out for special charging treatment exactly because they are not local and are involved in abnormal heavy use of local municipal roads.

What is of major concern the world over is the damage that can be done to rural roads by sector-specific (mining and logging for example), short-term, abnormal use. The huge impact and the costly consequences

of these activities were recently recognized in New Zealand and Australia. This realization arose in part from recently acquired information derived from rigorous asset-management-based engineering analysis that identified the extent of the damage that such operations impose. Asset (now often more expansively termed

“facilities”) management of transportation infrastructure networks⁹ worldwide has cast into stark relief the road damage that arises from exceptional use. A charging mechanism to recover these costs is a natural outcome of this improved information.

Best-Practice Models

Based on reliable data that provides evidence of exceptional road damage, exacerbator-pays principles can be effectively implemented. By using appropriate asset-management-based data, local governments can identify the sectors and industries responsible for the heavy-traffic road damage. The industries' exceptional usage costs can be assessed and they should be required to pay them.

In 2004, one New Zealand rural council, Southland District Council¹⁰ (SDC), was faced with evidence of an unprecedented rise in rural transportation infrastructure maintenance costs.

SDC found the causes. They considered the means of their cost recovery and realized that if they planned to impose separate charges for the road damage, the rationale had to withstand scrutiny, possibly from a judicial review concerned with the reasonableness of their actions. Their policy had to be supported by strong defensible evidence grounded on sound principles.

SDC had long suspected that damage was a result of heavy commercial traffic from milk tankers and logging trucks. The Council commissioned an independent, rigorous engineering-based assessment of these conditions.

- Exceptional heavy traffic on local roads created significant additional maintenance costs; as a consequence, renewal and maintenance schedules had to be brought forward.
- Concentrated short-term heavy traffic use came from logging operations, which were the worst offender. In some cases, after just a few weeks of intensive road use, rural roads that were being satisfactorily maintained under normal loads were being ruined and in need of reinstatement and/or reconstruction at enormous costs.
- There was a direct, fully documented road-engineering correlation between this short period of heavy use and the damage done. The affected roads were not given time to recover from the impact of such heavy traffic. Adverse weather and associated high rainfall, particularly while logging was in progress, further added to road deterioration. These factors were found to add significantly to increased road damage.
- By comparison, increases in private motor (light) vehicle traffic had negligible impact upon regular and other road maintenance programs. This evidence allowed SDC to reject long-held opinions of farmers and loggers that the impact of normal road use over time would equate

There was a wide choice of funding mechanisms open to the Southland District for raising revenue from the forestry and dairy industries...

with the damage created by exceptional use. The exact opposite proved to be the case. For varying usage of Southland roads, a rule of thumb factor was given currency at a 1:30 normal to exceptional cost ratio.

- User-pays central government subsidies funded from heavy vehicle hub odometer road-user charges and data of charges taken from time series accumulating rating levels paid for over time relating to forestry block property ownership were proven to compensate very little for the additional exceptional (enormous) transportation infrastructure costs arising from heavy vehicle use. As forests were established, the taxes paid over time by forestry owners fell well short of the road-related costs of logging and further justified another charging regime.
- SDC recognized the need to impose an exacerbator-, user-pays additional fee or tax upon forestry logging contractors (forest owners) and dairy operations in the following terms:

Forestry, Dairying and Tourism:
The cost of upgrading and maintaining roads carrying forestry and dairying traffic has been a difficult issue. While it is important that the road network supports these industries, the loading placed on often remote, traditionally low traffic volume roads is far greater than these roads were designed to carry. The Southland District has seen a huge increase in dairying in recent years, with the constantly changing routes of milk and whey tanker traffic creating further loading problems on rural roads.
- There was a wide choice of funding mechanisms open to the Southland District for raising revenue from the forestry and dairy industries. These included property taxation based on land usage, use of forestry property cropping capacity taxation differentials or multipliers, planned and actual truck-loading volumes and traffic movements data and property capital values including standing timber as well as forest areas and land values.
- All were considered and the targeted forestry sector land-use charge was ultimately chosen. This was fully supported by the data drawn from asset-management systems as well as from the findings of SDC's independently commissioned engineering report. Challenges were mounted to the Southland scheme (and for other councils, too) but to date these have been successfully settled. In some cases, settlement was reached when political pressure led to a reduction in the tax.
- The funding mechanism finally chosen by SDC is termed a *targeted rate*¹¹ (tax) levied in addition to existing conventional council taxes. It is specifically targeted at and justified by user-pays, exacerbator-pays cost recoveries and is intended to compensate for the damage done to roads because of their (exacerbator) actions.
- Other tactics that involved direct user pays include transportation infrastructure damage deposits and covenants and indemnities put in place *before* forestry operations were permitted.
- Council support was provided for the construction of special-purpose,

privately-funded forestry roads. In some cases, these were jointly funded from private (forestry) and public (Council) sources. The construction of these roads recognized the forming of a contract and as a factual acknowledgment demonstrating the mixture of public-private good utility of such roads. In these circumstances, it was evident that it does not have to be just the taxpayer that carries such costs. This cost-sharing had the effect of reinforcing Council positions with respect to user-exacerbator charges as well as limiting the costs and damage exposures for roads that are heavily used by the forestry and dairy industries.

While the SDC case is the only one cited in this study, it is but one of many with similar facts and circumstances. Other New Zealand rural authorities (councils) have introduced heavy exceptional road-user charges on a basis similar to Southland, and are mostly targeted at forestry users. Examples include the Far North, Kaipara, Gisborne and Wairoa District Councils. Such charges are increasingly commonplace and accepted. No council could have implemented their policies without the support of the evidence sourced from excellent roads asset-management plans.



Lessons and Challenges for Canadian Rural Municipalities

Canadian rural municipalities can benefit from the experience of the Southland District Council and others. They face similar issues in struggling to fund transportation infrastructure, particularly when exacerbator-imposed supernormal maintenance costs affect their locally funded roads.

The current political situation in Canada has involved appeals to provincial and federal levels of government for assistance in funding these exceptional costs. The essence of the argument is that municipal road use benefits sectors of the economy outside of their jurisdiction; thus, these costs should be funded by senior governments that better encompass the sphere of these activities and which can raise the appropriate revenue through other taxes.

However, such political remedies are far from ideal. They bring an additional problem of time-consuming political litigation with often unsatisfactory results. Meanwhile, even if the political battle for more revenue is won, rural municipalities often continue their poor asset-management practices, and the economic efficiencies that come from connecting prices to usage are lost.

By implementing activity-based asset-management processes that allow the costs imposed by an exacerbator to be accounted for and paid directly, significant efficiencies would be gained by the entire Canadian economy. The *political* allocation of resources that often occurs could be greatly lessened.

A larger question must be acknowledged: If rural municipalities are to implement many of the best-practice suggestions,

they need effective provincial legislation to integrate all aspects of their asset (facilities) management practice within their budgetary and taxation policies.

Thus, long-term integrated asset and financial planning for the funding of municipal activities would be needed for proper best practice to be implemented. Without these fundamental shifts in current practice, it may be that no single rural municipality will ever be prepared to bear the costs involved with being the first to restructure its revenue gathering.

With a proper legal framework in place at the provincial level, the next challenge will be for rural municipalities to implement the best available asset-management practices. There is ample precedent and best-practice methodology extant to implement these techniques economically.

At the municipal level, the right resources must be found to address the practical tasks involved. A study similar to that used by Southland District to assess local road damage would be essential in gathering the required data. These exercises can be complex and costly, and they demand engineering credibility of the highest order. In addition, financial management and analytical methods must fit the engineering and economic fact-finding. As well, legal and policy issues for the implementation of targeted charging regimes pose their own challenges.

The task of finding the better and fairer means for funding rural highway expenditures presents a challenge. However, the New Zealand precedent shows the way.

Sources

1. Municipalities of the Province of Manitoba, "Statistical Information 2004."
2. Ibid.
3. Kitchen, H., *A State of Disrepair: How to Fix the Financing of Municipal Infrastructure in Canada* (2007)
4. Ibid.
5. Ibid.
6. Ibid.
7. 'Renewals' is a term that engineers insist upon using even though accountants and laymen struggle with its definition. It is intended to cover costs of heavy (near capital) levels of non- periodic maintenance.
8. We include administration costs as they concern roads that lead to the over 50 per cent figure.
9. *International Infrastructure Management Manual, International Edition 2006* ISBN No: 0-473-10685-X, produced by the National Asset Management Steering (NAMS) Group.
10. Note that in New Zealand the term 'council' is used to describe both the governing body of elected officials and the broader municipal organization.
11. The New Zealand term for property taxes imposed by local government is a "rate."

Further Reading



The Case for Taxi Deregulation

Equity, efficiency and getting a cab when you want one.

http://www.fcpp.org/main/publication_detail.php?PubID=2615



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