Developing a Strategic Transportation Plan for UBC

Discussion Paper # 2: Options & Priorities

The Next Trek Begins!

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Comments, questions welcome: **suggestions@trek.ubc.ca**

The executive summary of this document is available for downloading at **www.trek.ubc.ca**

Please feel welcome to make copies of this document for distribution to others.

UBC Trek Program Center, 822-1304, trek@ubc.ca
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Executive Summary

In presenting this Discussion Paper #2: Options & Priorities, we face a dilemma. Our regional mandate is to cut vehicle trips to/from UBC by 20%, mainly by increased transit ridership, in order to promote improved air quality and reduced traffic accidents. There are many unanswered questions/issues (identified in Discussion Paper #1: Options & Opportunities) with the need for more information - from you and other stakeholders - prior to setting any real, definite strategic direction. For example, we know that one of the main keys to a successful trip reduction program (i.e. the TREK Program) is the TREK Card - which would provide its user with maximum travel mode choices - but we aren't yet sure if and what you like about it, what its price should be, and what sort of funding sources to pursue for it. Another key to reducing vehicle trips to UBC will be the ability for BC Transit to provide improved service and capacity to UBC in the short (buses) and long (LRT) term, but what premium must UBC pay for this service?

Presented in this discussion paper are **sustainable transportation options** considered feasible to address these and other issues - **you determine the priorities via the attached questionnaire**. Although some space for comments is given, feel welcome to make additional comments via email, additional pages - have we identified all issues, and/or all sustainable/feasible transportation options? Please return all comments to the UBC TREK Program Office by **March 1st**; comments received after that time will still be considered, but we hope to incorporate as many comments as possible for our next discussion paper, scheduled for March 5th on the Initial Draft of the UBC Strategic Transportation Plan.

It is very important to note in reviewing the options that **there are short and long term implications and solutions** - LRT cannot reasonably be expected to reach UBC for at least another 10 years - we need to address transit capacity by other means in the interim. We have **HIGHLIGHTED** those issues/options that we would like to consider in the next few years, versus those with an eye to implementation over the longer term.

The Table Below summarizes our leanings/conclusions for strategic directions based on information to date. It is not "set in concrete" but meant mainly as a reference to stakeholders which way we're inclined to proceed unless you feel significantly otherwise. Please review this paper carefully - it will take you a while, do it with a friend or group - Tuum est!

Summary of Preferred Options

Sustainability	X	GO Green coordinators
	X	Transportation Advisory Committee, Health&Safety subcommittee
	X	On-going annual monitoring to achieve targets
TREK Card	X	Great TREK Card provides unlimited transit access
	X	Flex TREK Card provides access to transit and parking
	X	Park TREK Card provides access to parking on campus
	X	TREK Cards include guaranteed ride home for faculty, staff
	X	Smart card technology for maximum flexibility
Pedestrians	X	Crossing improvements and expanded pedestrian facilities
	X	Walking shuttles for personal security
Cyclists	X	Bicycle lanes and shared-use roadways
	X	More lockers and racks
Car/Vanpooling	X	Ridematching service on campus
	X	Preferred parking
Transit	X	Adjust class schedules to spread out transit demand
	X	Liaise with BC Transit to increase service as soon as possible
Telecommuting	X	Formal policy for staff, faculty and students
Trucks	X	Incorporate measures to mitigate truck traffic in contracts
	X	Co-ordinate truck routes with City of Vancouver
Roads	X	UBC assumes control of all abutting roads
	X	Pro-active traffic calming program
Parking	X	Gradually reduce supply, increase price as transit is improved
	X	Specific measures for visitor and UBC services parking
	X	Increase enforcement of parking regulations
	X	Smart card technology
	X	Coordinate with housing parking
Land Use	X	Area traffic management and TDM plans
	X	Flexible land use guidelines
Getting Around UBC	X	On-campus shuttles, new bus loops
	X	Public bikes for on-campus travel
	X	Convert to yield signs at intersections, improve signage on campus

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I. Purpose of Discussion Paper # 2: Options & Priorities

A. Why this Discussion Paper?

Any strategic planning exercise requires stakeholder input on the issues and options. Not everyone gets involved, or has time to stay tuned to all the issues. **Discussion papers** are one tool to use for stakeholders to get up to speed and provide input on an important matter. The issue at hand involves the direction that future Transportation will occur to, from and on the UBC campus. A review of this issue has been mandated by the Greater Vancouver Regional District and agreed to by the UBC Board of Governors as part of the process to develop the east campus lands, reduce UBC parking needs, improve air quality and reduce traffic accidents - **this is a health, safety and sustainability issue**. As noted in Discussion Paper #1: Issues & Opportunities, the main overriding objectives of the UBC Strategic Transportation Plan (STP) are to **reduce trips to UBC by 20%** through development of a U-Pass type system (i.e. **the UBC TREK Card**) that relies heavily on **a 20% increase in transit ridership** as well as improvements to other non-Single Occupant Vehicle Travel modes. A fuller discussion of the background issues and mandate, together with copies of the UBC Official Community Plan 1997 Bylaw are available for viewing in the Land & Building Services Offices (2329 West Mall, UBC), or from the GVRD Strategic Planning offices in Burnaby.

B. Process & STP Structure

With the inception of the UBC OCP process and 20% trip reduction mandate, the university set out to benchmark traffic volumes in Fall 1997 - to provide a measure against which to measure future trip reduction initiatives. In January 1998, Discussion Paper #1: Issues and Opportunities was released as a reference for discussion of UBC transportation issues. Also, a detailed transportation survey was e-mailed to over 35,000 UBC students, staff and faculty to assess what travel modes are used, why, and, whether/how successful a TREK Card Program would be at UBC - to provide more detailed analysis on the trip reduction potential for various TREK Program initiative options. This Discussion Paper presents, based on input received to date together with an extensive literature research, feasible options have been proposed in accordance with the OCP objectives that any strategic transportation plan options be economy, ecology and community minded. The initial conclusions/recommendations highlights the options that in **analysis to date, have the most merit to form the policy for the Strategic Transportation Plan - it is given to provoke your comment and is not "set in concrete".** Note that options have been highlighted as to short and long term for reference - for example, an option for improving transit capacity to UBC in the short term is more buses, whereas in the longer term it could be LRT **- we need to consider both short and long term UBC transportation needs.** After viewing this paper and considering the options **conclusions/recommendations**, we would value

your input via the attached questionnaire; please submit by March 2nd so that comments can be collated, considered and incorporated into a Draft Plan in early March.

Critical elements of any made in UBC Plan is your participation, in the questionnaires, as noted already, but more importantly by staying involved via becoming Go Green Coordinator's (GGC's). Go Green Coordinator's are needed in each area on campus -student, staff, faculty (anywhere people commute to on campus) - GGC's will receive valuable training in trip reduction strategies and help get the word out/in. Final products of this intensive process will be the Strategic Transportation Plan in the Fall 1998. Because UBC operates on a semester system and many students will leave/ graduate by April, we would like to have an initial Draft Plan for your review available by early March. Subsequent to it's release, an implementation strategy and refinement of key components will be pursued over the Summer and Fall of 1998 with additional forums and consultation beginning in September/October 1998. A final report and the UBC Strategic Transportation Plan is expected to be presented to the UBC Board of Governors in late 1998.

C. Products

The UBC Strategic Transportation Plan will be implemented by the UBC TREK Program Office. Apart from policies governing land use and parking management issues, the major keys of the Plan will consist of Go Green Coordinator volunteer recruitment, and deployment of the TREK Card. Another key component of the STP will be the Truck Management Plan, to reduce intrusion/nuisance into adjacent residential neighborhoods. The final part of the STP will be its Implementation Plan, which will set out timelines, budgets, actions and responsibilities.

D. Trek Program and TREK Card

The UBC TREK Program and TREK Card components are summarized in the Table below - note that the product is still being researched and refined as part of the current transportation survey process underway. The UBC Trek Card program would combine all commute options into a single, integrated, sustainable transportation program where each mode is coordinated with and complements each other. For example, TREK Card holders could choose to use it's unlimited bus travel privileges to take the bus on a rainy Monday, then bike in and use a bike locker for free on a sunny Tuesday. Wednesday, the TREK Card holder might be n a hurry to get home and e-mail/phone into the TREK centre for the next available car/van pool heading to Port Coquitlam and grab a free ride. In a word, **the UBC TREK Card will provide FLEXIBLE commute options** - not everyone may be able to not drive, but if we choose to switch from driving alone on at least one more day per week than we do now, we will hit our 20% target!

UBC's new TREKCard follows the spirit of a similar SOV trip reduction program that has existed at the University of Washington in Seattle since 1991. It aims to promote student, faculty and staff access to all non-SOV travel modes to, from and on-campus through a single easy-to-use 'Universal-Pass' card, all for less than half the cost of a monthly transit pass.

Although still under development, the UBC TREK Card will entitle users to the following services:

Trek Program Components (Preliminary Concept Only)

For Transit Users	For Carpoolers & Vanpoolers	For Cyclists & Pedestrians
• Unlimited monthly rides (replaces existing reduced price passes) • Night time campus shuttle (enhanced service)	• Reduction in monthly fare • Preferential parking	• Free use of secure bicycle parking • Access to shower and locker facilities
For Everyone		
• One fee gains access to all non-SOV travel modes, with flexibility to switch between travel modes at little (i.e. van pools) or no (i.e. all other modes) extra cost, depending on work schedules, weather, etc. • Trek Card will be required for parkade and HOV parking, and possibly other parking areas • Unlimited monthly transit rides, including weekends • Occasional Daily Parking at reduced price • Guaranteed ride home (faculty and staff) • Discounts at area merchants • Rewards for continued use		

II. Strategic Transportation Plan Options

The Issue Groups identified on the following pages follow directly from Discussion Paper #1: Issues & Opportunities, together with additional feedback received to date. Options to address each issue have been researched and proposed which meet the UBC Official Community Plan objectives of **economy, ecology, community** evaluation criteria:

- **ecology** speaks to man's interaction with plants, other animals, his influence on / connections with his environment and others - UBC transportation ecology will support transit (local and regional), pedestrian and bicycle modes, and, follow transportation demand management principles, to reduce pollution
- **economy** speaks to costs of doing business, providing services, reality checks to ascertain that goods consumed with scarce resources follow principles of good stewardship to maximize sustainability - UBC transportation economy will promote efficient transit, auto-restraints, work/study at home, high density developments next to transit corridors
- **community** realizes that UBC must to provide for all of our human needs: social, spiritual, physical, mental, emotional - UBC transportation community will promote transit to both the campus and the residential areas, and, place priority on pedestrian, bicycle and transit modes through traffic calming, while still providing a hierarchy of streets for vehicular use as needed for access, services and parking

There are costs, and implementation issues which are still subject to further data, and analysis - the options discussed will seem mostly qualitative at this point, but still provide sufficient relevance for review. Conclusions/recommendations have been selected based on consideration of the noted pros/cons, cost, and implementation/sustainability issues.

The issues/options have been differentiated for review according to their long and short term benefits/impacts/implementation potential.

Please complete the attached questionnaire and provide you input to setting priorities for development of the UBC Strategic Transportation Plan.

A. Sustainability - A LONG TERM ISSUE WITH SHORT TERM OPTIONS

The Independent World Commission on Environment and Development defined sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The UBC Strategic Transportation Plan must support UBC development in its goal to be sustainable.

Overall Data:

- The City of Vancouver would need an area of arable land equivalent to 200 to 500 times its current area to sustain itself based on current rates of consumption and waste.
- Each year, vehicles exhaust their own weight in Carbon Dioxide
- 75% of the air pollution in the GVRD is caused by traffic
- Incidence of asthma visits to hospitals in the GVRD in children have doubled in the last 10 years
- In 1990, 600,000 tonnes of primary air pollutants (carbon monoxide, volatile organic compounds, nitrogen and sulphur oxides and particulate matter) were emitted into our local atmosphere - enough pollution to more than fill BC Place Stadium every day for a year. Exhaust from motor vehicles accounted for 77 % of this pollution. (GVRD, Let's Clear the Air, 436-6767, Call 1-800-665-1118 for daily air quality readings)
- traffic accidents cost on average $30,000 per claim due to property damage, and personal injuries and suffering;
- More than 500 eco-counsellors are at work throughout Europe *(Germany, Switzerland, Austria, Italy, Spain, the UK, France, Luxembourg, and Belgium).* The concept of environmental counseling was originally developed in Germany in 1985) as a means of providing detailed, impartial and practical environmental advise to individuals on an individual or small-group basis (e.g., schools, women's groups, businessmen, householders) on matters ranging from energy conservation to way pollution. The central idea is that the environmental adviser, largely by virtue of his or her personal contact with members of the community in which he or she works, can achieve small-scale but long-term behavioral change which in turn can lead to a large-scale improvement in the environment. Eco-counsellor training programs and even masters degree programs in environmental counseling are now being offered in Europe. Estimates from Austria indicate that local eco-counsellors typically produce savings double to their costs through identification of waste reduction measures.
- Cars stuck in traffic pollute three times as much as those purring along motorways, negating the effect of ever-cleaner exhaust emissions brought about by better catalytic converters and cleaner-burning engines.

Further data needed:
Vancouver task force report on Urban Noise
Regional Benchmark data from:
BC Transit
City of Vancouver
GVRD

A. Sustainability

1. Education -SHORT TERM

How can we educate students, staff, faculty and others who travel to UBC regarding the availability and benefits of alternative travel options? Education has been an important factor in the success of recycling and energy conservation. What are the best options for education regarding transportation choices?

	Basic	Moderate	Partners
Description	Brochures , Web Site, Public Forums, UBC ??	Also add to Core Courses, Symposiums, Newsletter	Also Partnerships with outside School Boards/Fac's (courses, workshops) and other Colleges/ University/Municipalities
Pro's	• Low cost • Uses existing processes • GGC's could plug in through existing H&S committee	• Moves towards a life skills course • SDI could offer us an elective; expertise already on campus • made entirely in UBC	• Much of the infrastructure for this exists in SDI • Gets to next generation who are more adaptable • Most sustainable • Would spread across the region • Opportunity to share the costs, realize synergies • Could link to walking, school bus
Con's	• Most students will required "push" to read • Question effectiveness of status quo	• Adds another burden onto course load • Likely the highest cost • Much expertise/ideas exist off campus too	• Highest costs, development of curriculum • Multiple agencies coordination
Costs	• Brochures 30,000 @ $0.10 • Web Site – Requires ongoing maintenance & updating 2 hrs/wk @ $50/hr • Public Forums $1,000 each @ 4/yr	• Core Course Development & professor/classroom	• Module development • Administrative costs
Implementation Issues	•	• Is the space (i.e. physical and time) to fit in to existing curriculum?	• Requires buy-in from School District, Municipalities, other Universities • Need to determine a workable committee structure

Conclusion/Rationale:

Start with basics and as experience/momentum increase, this educational process may naturally evolve to a partnerships model, although this may take some initial facilitating through staff/media contact. This will keep program cost low throughout.

A. Sustainability

2. Participation - SHORT TERM

How do we empower UBC commuters to buy into and thereby solve their own commuting problems? Through participation of everyone on campus, we can ensure that the resulting Strategic Transportation Plan meets everyone's needs, and is the best possible plan.

	Via UBC Committees	Go Green Coordinators	Via Ad Hoc UBC Stakeholder Groups
Description	Staff, student, faculty involved via various committees at each site	GGC volunteers at each site Uses existing BC Transit/GVRD program	AMS, GSS, AAPS, CUPE, Faculty, Residents - forward/request info as needed on TDM/TREK Program
Pro's	• Cell groups of staff in each area who know/work with each other are more approachable and self-sustaining than if approached by an "outsider" • "grass roots" or bottom up approach	• brings in more people passionate about the issue as well • UBC Go Green Coordinator committee greatly enhances TREK Program profile on campus	• each stakeholder group typically has a communications coordinator that can be used to get the word out • enhances due process, ensures full consultation and promotes equity of across all stakeholders • top down and bottom up approach • greatest accessibility
Con's	• May miss most staff unless highly motivated committees • committees deal with many issues of which this is one – may be over subscribed	• while volunteers imply a committed, passionate team, it may still not be representative of all stakeholders	• staff time higher as no help from committees • requires more support staff
Costs	• GGC training @ $50 plus time off (common to all)	• materials = $50/volunteer • volunteer time = 1 day training 1hour/month	• most volunteers = costs • training materials • staff time higher
Implementation Issues	• GGC's require training (common to all options) • need to solicit/get volunteers from all UBC locations (common)	• soliciting GGC's • maintaining GGC's • training GGC's	• Terms of Reference needed • Administrative endorsements and appointments

Conclusion/Rationale:

Soliciting Go Green Coordinators through existing UBC Committees (e.g. TAC, H&S, others) and UBC Residents Association, CUPE, AAPS, AMS, GSS and Faculty members would provide a good base from which to encourage all UBC stakeholder groups to participate. It could also be built upon as more training/volunteers become available.

A. Sustainability

3. Monitoring - SHORT & LONG TERM

Monitoring is essential in determining whether transportation plans are making a difference and helping to achieve UBC's stated goals. Measures of effectiveness need to be developed consistent with those in use throughout the GVRD, for comparison and bench marking purposes. Data must be collected on a regular basis, in order to track changes in travel patterns.

	Bi-annual	Status Quo - Annual	Semi-Annual
Description	Every other year	Once every year	Spring/Fall every year
Pro's	• lowest costs & nuisance factor • could contract to consultant	• traditional and consistent (every fall)	• better data tracking on price increased & seasonal influences
Con's	• not consistent with past UBC practice • sends wrong message • may miss trend, takes too long to respond	• misses highest bike and pedestrian use period (i.e. in March)	• highest costs, but may be some economy of scale • would likely make sense to do in-house
Costs	• traffic counts $6,000 • analysis $4,000 • questionnaire $25,000 • $35,000/2 = $17,500/yr	• $35,000/year	• possible new staff $65,000
Implementation Issues	•	• status quo	• need excellent data analysis/management system • possibly new staff

Conclusion/Rationale:

Status Quo - current data stream/monitoring is adequate; expand to semi-annual as needed in specific cases.

A. Sustainability

4. Coordination - SHORT TERM

It is important that UBC's activities which affect sustainability are coordinated. That is, these activities are undertaken in a way that results in each activity increasing and enhancing sustainability, rather than detracting from other activities. Who should be responsible for this coordination?

	Informal	Formal Liaisons	Steering Committee
Description	TREK Office with loose reporting relationship/liaison with existing UBC Committees (e.g. Health & Safety, TAC, etc)	More formal relationship, possibly through an Advisory sub-Committee (e.g. TAC, H&S)	TREK Program Steering Committee (TAC, H&S Subcommittee)
Pro's	• keep things simple	• TREK office still intact, maintaining OCP/TDM focus • many hands make light work • not subject to H&S Committee approvals, but still have access to H&S network • some accountability	• increases credibility • synergy advantages • accountability
Con's	• lacks networking/synergy opportunities • administrative load heavier • less accountability	• no real authority • less accountability	• which UBC committee is most appropriate? • may get caught up with/stalled in other TAC/H&S Committee priorities
Costs	• staff time higher initially to get off the ground	• about the same regardless of whether advisory or steering	•
Implementation Issues	• need additional staff sooner • networking to solicit GGC volunteers	• monthly H&S Committee reports	• need to ensure other H&S priorities do not impede implementation • board approval for a subcommittee?

Conclusion/Rationale:

Formal Liaisons - Seek more formal liaison as a reporting subcommittee to the UBC Transportation Advisory Committee, and/or Health and Safety Committee, reporting in an advisory relationship. This will maintain formal stakeholder reporting relationship, link TREK program to an ongoing program, enhance credibility, and take advantage of synergies/available administration resources.

A. Sustainability

5. Marketing - SHORT TERM

How do we present new transportation choices to students, faculty, staff and others at UBC? What media and methods are most effective in reaching our target markets? What messages do we want to convey?

	Annual	Semi-Annual Program	Aggressive Program
Description	**Annual** events/prizes	**Semi-annual** events (spring/fall)	**Monthly** events/prizes, newsletter
Pro's	• lowest costs • lowest admin. • could tie into the annual UBC Clean Air Day program	• tied closer to academic calendar • may be possible in longer term to back off to this to maintain momentum	• keeps TDM fresh in their minds • keeps up momentum • good for initial start-up to raise awareness
Con's	• lose momentum • becomes an awareness/education problem for new students	• once each term is soon forgotten	• intimidating factor
Costs	• Prizes: $2,000 • Ads: $500 • Brochures: $5,000 • Web Site: $2,000	• Prizes: $2,000 • Ads: $2,000 • Brochures: $2,000 • Web Site: $2,000	• Prizes: $5,000 • Ads: $5,000 • Brochures: $5,000 • Newsletter: $5,000 • Web Site: $5,000
Implementation Issues	• need a brochure consultant • need someone to do research and maintain web site	• need a brochure consultant • need someone to do research and maintain web site	• need a newsletter editor/builder • need a brochure consultant • need someone to research and maintain web site

Conclusion/Rationale:

Initially, need to focus heavily on marketing by **monthly** initiatives. Once awareness is raised and program well underway via quantifiable successes, could back off to semi-annual marketing/events/ newsletter.

B. Trek Card - A LONG TERM PROGRAM WITH SHORT TERM OPTIONS

The Trek Card will be the cornerstone of UBC's Strategic Transportation Plan. It will provide the means of delivering flexible transportation services to all persons traveling to and from UBC, and traveling between locations on campus.

Overall Data:

- A program at the University of Washington, called U-Pass has resulted in at 22% reduction in SOV's within the first six years of its inception
- The backbone to TREK Card will be improved transit service
- The key to keeping program and card costs low is wide participation
- In other GVRD work locations, Go Green Coordinators are being solicited to work as volunteers with the GVRD Go Green office to disseminate trip reduction options/information to each work/study site; if you would like to get involved in a similar volunteer program with the TREK Program, contact 822-1304

Further data needed
Data Needed: Survey Results
Diagrams: Survey Results related to each of the following issues

B. Trek Card

1. Product Design - SHORT TERM

The Trek Card concept has been successful in the U.S., most notably at the University of Washington, but it has never been tried in Canada. To ensure that the Trek Card is successful and meets users' needs, research is required regarding various aspects of the product design ? one that appeals strongly to UBC students, faculty and staff ? using the most effective change agents.

	One Card Fits All	More Than One Type of TREK Card	No TREK Card Leave with BC Transit
Description	$40 • transit pass, up to 5 free parking passes per month, on-campus shuttle, guaranteed ride home, merchant discounts, ridematching, bike lockers • all on same card	• TREK 1 Basic (no parking $35-$40 – transit pass only • TREK 2 MD $60 – allows 10 days parking with $5/day thereafter • TREK 3 Premium $80 – transit pass, daily parking only with, allows full month parking	Don't do – drop the card idea and do TDM through separate programs parking price/supply, BC Transit service improvements, car/van pool program enhancements, bike path improvements
Pro's	• simple to administer	• realizes different needs • encourages transit	• Leaves administrative costs/headaches with an external agency
Con's	• differing degree of appeal to different groups means may be low overall appeal	• promotes non-TDM (i.e. allows parking only)	• Lack of control by UBC over setting product, • Cannot link to other services (guaranteed ride home, car/van pools, bikes)
Costs	• Lowest	• Highest	• Moderate
Implementation Issues	• Business Plan	• Product design research and marketing • Business Plan	• Negotiations / liaison with BC Transit •

Conclusion/Rationale:

More than one type of TREK card appears to be needed to address the UBC market. Initial survey results indicates that there is significant interest in purchasing / using a "made in UBC" TREK card.

Data Needed:

- Is price in the right range?

B. Trek Card

2. Guaranteed Ride Home - SHORT TERM

One of the key features of similar programs in other communities is the guarantee of a free or low-cost ride home in case of emergency, for persons who did not drive. How can this important and valuable feature be provided without being subject to abuse? Who should be eligible, and should it be free or subject to a nominal charge?

	Not Included	Staff/Faculty Only	Everyone at UBC
Description	There is no reimbursement	Staff/faculty only get reimbursed	Students also
Pro's	• lowest cost • keeps TREK card cost low • wouldn't benefit those close to campus in any case	• most common form • limits use to group most likely to use/need (i.e. those with families/after work obligations)	• most equitable • greatest safety net
Con's	• leaves no incentive to risk a non-SOV trip; no safety net • would hurt TREK attractiveness	• mature students needs not addressed; • adds approximately $10 to cost of card	• highest cost; adds large cost to TREK card • questionable benefit spread too thin
Costs	•	• 10,000 staff @ $150 × 50% • 2,000 faculty @ $150 × 50% assume 6% actually use: $60,000 OR $10/card premium	• students 30,000 × 70% × 100 × 10% • staff/faculty @ 60,000 • $270,000 OR $10/card premium
Implementation Issues	•	• monitoring • reimbursement process adds to finance/administrative duties (90/month)	• monitoring • even more administration (grows to 400/month or over 10/day)

Conclusion/Rationale:

Grant to staff/faculty at a premium only but allow students the option to buy the more expensive card if they need the guaranteed ride home.

B. Trek Card

3. Price - SHORT TERM

Perhaps the most important factor in the design of the Trek Card will be the price that is assigned to it. If the price is set too high, the Trek Card would be less attractive, but if set too low, it would quickly create a deficit which would require diverting funds from other transportation services. Little data is currently available to indicate what pricing thresholds might exist among faculty, staff and students regarding various transportation services and the overall Trek Card program.

	One Low Price fits all	Responsive TREK Cards	Multiple Zone TREK Cards
Description	As low as possible. No reserve or "cushions." One price for all.	Great TREK, Flex TREK, (i.e. transit), Part TREK	Student 1 zone Staff/Faculty 2 zone 3 zone
Pro's	• spreads program cost across all travel modes and all transit zones • spreads peak periods out • only 2 cards (i.e. students, staff/faculty)	• consolidates all 3 transit zones • addresses permit parking, and provides credits for days not parked	• closest to user pay yet still realizes economies of scale savings
Con's	• leads to a one user group subsidizing the other (e.g. parking permits subsidized by transit passes) • does not address permit (i.e. daily) parking; no inducement to not park	• 4 card types increases administration	• greatest administrative costs for potentially 19 card types! • 1 zone users subsidize 2 and 3 zone users.
Costs	• $60 for everyone, which is more expensive than transit	• Staff/faculty $45 • Students $35 • Flex $70 • Park $86	• Great TREK Staff/faculty: 1 zone: $42, 2 Zone: $48, 3 Zone: $53 • Great TREK Student: 1 Zone: $32, 2 Zone: $38 3 Zone: $43 • Flex TREK: 1 Zone: $67 2 Zone: $73, 3 Zone: $80 • Park TREK: 1 Zone: $86, 2 Zone: $86, 3 Zone: $86
Implementation Issues	• difficult to gauge success/financial projections	• Coordination between P&T, and Transportation Planning • who issues, keeps records, handles paper work	• need to reduce number of different card types that bus drivers need to recognize • photo ID

Conclusion/Rationale:

Responsive: Tending towards user pay, but keeping program as simple as possible, both to understand and to administer.

B. Trek Card

4. Payment Method - SHORT TERM

While the intent is to maximize the flexible nature of travel to/from UBC and to be customer oriented, the administrative costs need to be minimized. Annual purchase plans would be simplest but likely not practical on limited budgets - monthly and semester payments are the alternatives.

	Annual	**By Paycheck or Monthly**	**Status Quo By Semester**
Description	Annual	Payroll deduction Debit card Payment	Staff/faculty by payroll deduction Students pay up front
Pro's	• could reduce cost be interest rate assumed • easier to administer • less risk to admin	• discourages black market • easier to enforce if monthly stickers required • caters to limited cash flows	• Status quo
Con's	• refunds a problem (could charge admin.) • most can't afford one lump sum • lost/stolen cards at what cost?	• increase admin. • opt out adds risk • highest admin. costs	• discriminates against students
Costs	• least	• Highest	•
Implementation Issues	• initial issuance requires additional staff • lost/stolen cards at what price? • refunds?	• Need more debt card machines at point of issuance	•

Conclusion/Rationale:

Stick with Status Quo until SMART Cards in use which could be turned off/on depending on whether payment had been received.

B. Trek Card

5. Participation - SHORT TERM

The key to the success of the Trek Card will be a high participation rate by students, staff, faculty and others on campus. The more people who participate, the more people there are to share program costs, and the lower the cost per Trek Card. One means of encouraging higher participation is to make the Trek Card mandatory.

	Mandatory	Automatic	Optional
Description	Students – as part of student fees, would need referendum Staff/faculty – as a requirement of parking pass, otherwise not possible	Students – automatically enrolled (opt-out) as part of fees, still need referendum Staff/faculty – automatically, as in place of parking permits	Offered as a service that must be purchased Solely at buyer discretion
Pro's	• lower cost $20 to $30 • simpler to administer • equity, everyone pays same	• Lowers program cost • Many people that aren't aware of program automatically enrolled and benefit from it • Compromise	• No referendum req'd • Promotes freedom of choice • Initial survey results suggest high support for this option
Con's	• Politically questionable • Initial survey results suggest low support • not everyone will use the same • need "decrement' card (i.e. SMART Card) to track use to assess equity issues • not everyone has same commuting issues/ constraints	• Negative marketing perception • Open to criticism	• More marketing required • Communication/education hurdles • Higher program costs to promote • Persons that would benefit not immediately aware of. • Likely lowest participation rates will lead to high TREK Card costs, putting program viability in question
Costs	• Lowest TREK Card cost per user	• Moderate	• Highest per card
Implementation Issues	• Marketing • Budgetting • Price/Product design	• Phasing into existing system • Marketing • Budgetting • Price/Product design	• More than one permit parking /bus pass system • Marketing • Budgetting • Price/Product design

Conclusion/Rationale:

Automatic Enrollment - A compromise to keep card/program costs down while maximizing TREK Program exposure and giving users the option to opt out of the program.

Data needed: Referendum –S/ESS Regulations/policy.

B. Trek Card

6. Implementation Date - SHORT TERM

Although the target implementation date for the Trek Card is September 1998, BC Transit has expressed concerns with meeting this date. A lot of work needs to be completed prior to implementation, and if September 1998 is not possible, then when would be the best date for implementation?

	Limited 1998 Introduction	Introduce in '98 UBC pays some portion for extra buses	Introduce in '99
Description	• ramp up services offered • negotiate with BC Transit limited TREK Card use • fully optional • other services as possible	• $80/service hour/bus • UBC pays 50% recognizing service benefits/used by off campus •	• wait until more elements are known and/or in place
Pro's	• maintains momentum • supports OCP • pro-active • keeps pressure on GVTA/BC Transit	• capacity is there • could make demand responsive • UBC takes lead role • meets proponents desire	• BC Transit more comfortable • likely tie in with GVTA
Con's	• BC Transit capacity questionable • if not done smoothly, program credibility suffers	• $$$! @ $½ million per year • UBC doesn't control BC Transit • BC Transit would prefer 1999 • rushing deal may jeopardize	• lose one year of momentum • harder to hit 20% SOV reduction • SOV trip may increase meanwhile • no guarantees on 99 capacity improvements by GVTA/BC Transit
Costs	• Moderate	• 560 buses current daily – 672/day • Add 20% – 112 @ 50% x 4 hour minimum x $80/hour x 250 days = $ ½ m/year	• Lowest
Implementation Issues	• Negotiations with each service provider continue	• Negotiations with BC Transit, other service providers intensify • Bus availability, leasing	• Negotiations with BC Transit/GVRD, other service providers

Conclusion/Rationale:

Limited 1998 TREK Card introduction - maintains momentum but realizes that BC Transit may not be able to deliver for another year.

Data Needed:
- cost premium for support facility
- BC Transit ability to get extra buses for Fall 98
- BC Transit capacity in shoulder of peak period
- how many more buses coming to UBC in 99 under GVTA

B. Trek Card

7. Technology - SHORT TERM

Technological improvements offer a means of minimizing Trek Card program costs, minimizing abuse, and maximizing data for monitoring purposes. What new technologies would be appropriate for the Trek Card program, what other agencies would be involved, and what would be required to implement these technologies?

	UBC Library/Student Card w/sticker	Magnetic Swipe Card	BC Transit Monthly Pass w/sticker	Imbedded Circuit/ SMART/Decrement Card (Photo ID)
Description	Similar to Fast Trax	• Technology exists, in use at UBC for parkades • Can use as a credit card to some extent, but clumsy, some slippage	Similar to existing On campus services would need a sticker	• Individual card, with photo id if desired • Can store personal data and but credits for use that don't expire until used
Pro's	• in use already	• in use at UBC	• Easier to implement • BC Transit accepts	• lasts for at least 2 years
Con's	• limited in monitoring / enforcement ability • transferable • BC Transit will not support without photo id, which staff cards don't have	• $3/card to produce • another card for BC Transit to read • some slippage/errors/ failures occur as magnetic stripe wears (needs renewal every year)	• no photo ID, which BC Transit will not support	• twice as expensive ($7/card)
Costs	• Lowest	•	• Potentially high if abuse occurs	• Highest
Implementation Issues	• How/Who from/where to get stickers	• Initial issuance	•	• Issuance period delays/costs • Initial start-up •

Conclusion/Rationale:

Swipe Card - UBC already has the hardware to implement, including a photo id - swipe provides for security if lost (i.e. de-activation to prevent abuse/recover). Try to implement with Student card to reduce duplication of effort in longer term

Data Needed:

- any way to reduce SMART Card costs/increase longevity?

B. Trek Card

8. Funding - SHORT TERM

In addition to revenues generated through sales of Trek Cards, what other sources of funding might be available? Any funds generated from other sources help to reduce the cost of the Trek Card for users.

	None	Development Cost Charges	Opportunistic/Grants	Corporate Sponsors
Description	No other sources	Levy placed on all new development at UBC, on and off campus to fund trip reduction	Take when offered One time grants	Solicit "Coca-Cola"
Pro's	• self sustaining • no future "downloading"	• new growth responsible for new traffic • direct user pay implications	• grants could be used to build up reserve and/or keep prices at same level	• returns to UBC a portion of profits gained at UBC ??? • gets program off the ground easier
Con's	• no added incentive • highest prices	• reduces development marketability of sites • existing developments must also contribute somehow	• increase dependence outside of UBC • effort may not be worth it	• perceived corporate agenda influence risk • perception/politics may be costs that outweigh benefits
Costs	• as under B3	• Revenue could range from as low as $100 to as high as $500 per residential or commercial unit	• if we assumed $100,000 per year possible (but no guarantee) the TREK Card cost would drop in the order of 1% or 25 to 50 cents	• depends on sponsorship level and duration • likely minimum of $100,000/year or more
Implementation Issues	• None	• Establishing equitable unit rates	• preparation of grants	• agreement/solicitation • political issues • policy issues • control issues

Conclusion/Rationale:

Opportunistic: If grants are available, apply for them, but do not lose focus of program/administrative priorities. As program matures and/or staff resources available, consider approaching corporate sponsors.

C. Pedestrians - SHORT TERM ISSUE

Walking is the primary means of travel for on-campus trips. For short-distance trips ? generally up to one kilometre ? walking is the most efficient means of travel. It is fast and direct, there is no need to park a bicycle or car, and there is no additional cost involved.

Few trips to or from UBC are made entirely on foot, as it takes a minimum of 30 minutes to walk from campus to Blanca Street in Vancouver. However, most trips to and from campus involve a walking trip of significant length ? such as the walk to or from the bus loop, or to or from a parking lot.

There are several means of encouraging walking and improving conditions for pedestrians on campus, and on routes to and from campus, as described in this section.

Overall Data:

- The average walking speed of people is 1.2 metres per second; for UBC students, this is likely low and should perhaps be in the 1.5 metres per second range
- Walking is not only the most sustainable form of transportation, it also promotes general health and well being, especially when done on a regular basis for a minimum 30 minutes per day
- Recent research suggests that the benefits of walking are cumulative; that is, several shorter walks on the same day have the same benefits as one longer walk on the same day.

Further data needed
Data Needed: Volumes of disabled
Walking times across campus
Furthest apart class combinations
Inventory, lineal metres of walks on campus
Rainfall/sunny days per year

Maps: corridors, bins Diagram: coverings

C. Pedestrians

1. Safety - SHORT TERM

Safety concerns arise when pedestrians must cross roadways used by motor vehicles and bicycles and/or walk along improperly built/maintained corridors. How can pedestrian safety be improved in these locations, without restricting access for pedestrians or discouraging walking? Moreover, how much of an issue is this, given that much of UBC is a pedestrian dominated campus - what needs to be done

	Educate	Intersections	Comprehensive
Description	Educational programs to promote pedestrian safety on campus.	Education and crossing improvements as needed (i.e. median refuges, crosswalks, pedestrian signals).	Education, crossing improvement, and pedestrian facilities as needed.
Pro's	• inexpensive	• improves crossing locations for pedestrians and potentially increases number • could combine with mid-block traffic calming	• ensures that all aspects of safety, including sidewalk condition, are included • supports OCP
Con's	• no physical inventory or improvements to improve safety	• neglects any improvements to sidewalk network (i.e. deficiencies)	• expensive since it may involve sidewalk construction or reconstruction
Costs	• Lowest	• Moderate	• Highest, but could be reduced through redevelopment
Implementation Issues	• Educational literature, signage	• intersection standards • priority location identification	• facility inventory/needs • capital cost & maintenance • priorities on corridors

Conclusion/Rationale:

Comprehensive - As redevelopments occur, adjacent pedestrian corridors can be upgraded. Meanwhile, establish inventory and priority locations for upgrading as OCP implementation/funding permit. This may include identification of corridor needs off outside UBC, for example lighting/pathway paving along University and/or Chancellor Boulevards.

C. Pedestrians

2. Personal Security - SHORT TERM

The threat or fear of assault is an important concern for persons walking to, from and around campus ? especially after dark, and in areas and at times when there are few others around. What facilities and programs would help to reduce the fear and actual rate of assault?

	Status Quo	Walking Shuttles	More Security Buses & Patrols
Description	AMS Safewalk, Security Shuttle, Emergency Stations, Late Night Security requests, improved lighting, security patrols in cars	Leaving at specified times using pre-specified routes	
Pro's	• established programs that are easy to maintain and upgrade	• supports OCP/clean air • save on the cost of additional shuttle buses • similar to models being implemented in other areas • similar to existing AMS safewalk but expanded to regular routes/schedules	• greater security presence and more frequent shuttle service
Con's	• more options may be needed to accommodate more persons with different schedules, destinations, etc.	• relies on committed volunteers, but could augment with paid staff	• expensive to obtain additional vehicles and employ more security
Costs	•	• volunteers, possibly some paid staff	• Highest
Implementation Issues	•	• soliciting volunteers versus additional/re-assigned staff • program administration • route planning	• fleet management

Conclusion/Rationale:

Walking Shuttles - This is essentially augmenting the AMS safewalk, ties onto an existing program, but relies on fixed schedules/routes.

C. Pedestrians

3. Comfort - SHORT TERM

One means of encouraging walking is to make walking more comfortable and attractive. Aspects of comfort include protection from the weather, illumination, the visual appearance of pedestrian corridors, and amenities such as litter containers, benches. There already are "Greening the Campus", campus lighting, and campus litter programs in place.

	Covered Walkways	Tree Canopies	Status Quo
Description	Covered walkways	More trees	Leave open
Pro's	• greater protection from elements, especially rain	• improve aesthetics for pedestrians on campus • sustainable • promotes OCP/clean air	• no cost involved
Con's	• expensive to provide covered walkways on all popular routes • may not be aesthetically attractive	• creates more shadows and less light • expensive given maintenance requirements (i.e. leaf collection) • creates hiding places for potential assailants • time factor - no leaf canopy present for Fall/Winter	• current walking environment can be uncomfortable due to rainy conditions which creates puddling and slipping hazards on wet leaves
Costs	• Highest capital /maintenance	• Moderate to plant/maintain	• Lowest
Implementation Issues	•	•	•

Conclusion/Rationale:

Tree Canopies - Promote continued greening of the campus. Where nearby buildings permit, consider installing covered walkways.

C. Pedestrians

4. Disabled Access - SHORT TERM

Persons with disabilities have difficulty with stairs, narrow passageways, long distances between locations, slippery surfaces and poorly-illuminated areas. UBC has done much already to make the campus more accessible for persons with disabilities. What locations on campus still create problems for disabled persons, and how can these problems be overcome?

	Status Quo	HandiDART
Description	AMS Safewalk, Security Shuttle, Personal Vehicles, ramps, lights	HandiDART type service
Pro's	• combined with programs to provide safe and secure access to pedestrians of all abilities, not just persons with disabilities	• door to door service that is convenient for users, especially on a large campus
Con's	• more improvements can be made to enhance access for persons of all abilities, especially given size of campus	• expensive to operate given low level of demand on campus • equity issues • BC Transit may not support; UBC may need to consider providing on its own • more vehicles on campus
Costs	• Lowest	• 1 or 2 HandyDARTs daily at UBC
Implementation Issues	•	• scheduling, routes

Conclusion/Rationale:

Status Quo - Need more data on HandyDART costs and how often/what access is provided currently, prior to pursuing major HandyDART service as part of TREK program.

C. Pedestrians

5. Walking Distance Between Classes - LONG TERM

Often, students and faculty must travel long distances from one class to another, with only a few minutes time available between classes.

	Precincts	One-Half mile	Status Quo
Description	400 m maximum distance Maintain classes within precincts for each faculty	800 m maximum distance About a 9 minute walk	No maximum distance
Pro's	• reduced walking times • efficient class changes for students	• walking times reduced moderately • greater flexibility for class scheduling	• no impact on class scheduling • promotes walking on campus (i.e. healthy)
Con's	• creates inflexibility with class scheduling • may be unrealistic given variety of course programs and limitations of class resources	• may still impact class scheduling • walking times may still be too long for slower walkers	• long distances difficult for persons with disabilities • impacts efficiency of class changing for students, thus disrupting beginning and end of classes
Costs	• administrative - high	• administrative - moderate	• lowest, but high for students in terms of time lost/preparation
Implementation Issues	• scheduling of resources	•	•

Conclusion/Rationale:

Status Quo - Need more data on how often classes are scheduled across campus, and numbers of faculty/students impacted. Until then, not sure the benefits outweigh the administrative costs

D. Cyclists - SHORT TERM ISSUES

On a typical rainy winter day, at least 1,500 people cycle to and from UBC 2.6% of all trips, and another roughly 2,000 peddle from on-campus residences to class (totaling over 5%). During warmer, sunnier months, that number may be as high as 6,000 persons or more. And yet other universities such as in Davis, California and Madison, Wisconsin achieve even higher numbers of trips by bicycle over 20% in some cases!

This means there is still tremendous potential at UBC to increase cycling, and the data bears that out. For example, 40% of UBC students live on the West Side of Vancouver, within 40 minutes cycling distance of campus.

Overall Data:

- UBC Bike Locker Program: Located behind the War Memorial gym are 70 secure bike lockers. UBC Athletics (Kim McElroy, 822-3094) administers the leasing on a 4, 8 and 12 month basis for Students: $80, 150, and 180 respectively ($100, 180, 240 for staff/faculty). The lockers are not owned by UBC - they are privately supplied/maintained - UBC administers the leasing and cost shares revenues with the supplier. There is room to provide at least another 30 lockers as demand warrants.
- Copenhagen's Free Bikes: There is no excuse for not cycling. No bike? Help yourself to one of 2,000 free ones available from cycle parks all over the centre. These "city bikes" are released by inserting the equivalent of $3 into a slot on the frame. The money is recovered when the bike is left at any other bike park, similar to the system used for supermarket trolleys in many countries. Few city bikes are stolen - though a "souvenir" turned up in New York - mainly because they are not high-quality machines (i.e. plastic) and are recognizable by their gaudily colored wheels bearing the names of sponsors (i.e. Coca Cola). But they are adequate for getting around the centre, and the scheme, now in its third year, has been a success.
- Just published in 12/1/97 "Bicycle Retailer & Industry News" is an article that reports on a nationwide "Bicycling" magazine study: the number of bicycle commuters has grown nationwide from 3.3 million in 1990 to 7.9 million this year! Back in 1990, Bicycling did a survey that showed that 7.9 million cyclists would bike to work "if the conditions improved." Perhaps they have. Now the *current study* says that if conditions improve, 29.9 million would commute by bike!

Further data needed
Data Needed: Cash flow for lockers, broken down by rate structure/usage
Cost per stall for secure bike parking/showers in buildings

Diagrams: Possible Route options

Show links to City of Van routes

D. Cyclists

1. Bicycle Routes - LONG TERM

For many years, cyclists have complained about the lack of proper bicycle routes to and from campus. Although some routes have been improved, others ? particularly University Boulevard ? are still considered unsafe and unattractive by most cyclists. Routes are also needed on-campus, particularly as UBC develops south of 16th Avenue.

	Share the Road	Bike Lanes	Off-road Paths
Description	Widened curb lanes along major corridors, such as Wesbrook Road	Striped bike lanes along major corridors, such as SW Marine Drive	Bike paths such as University Boulevard Or parallel bike friendly streets
Pro's	• minimum cost • quickest to do, just signage	• consistent with chancellor, 16th • raises profile through stencils/signage	• best for timid cyclists • minimum overall risk
Con's	• not for timid cyclists, which	• not consistent with others in GVRD (e.g. Vancouver) • increased cyclist/vehicle accident risk at driveways, intersections • need curbs moved/trees?	• lack of parallel corridors at UBC • committed cyclists want to be on major routes • highest cost of capital and maintenance • complaints over current UBC path
Costs	• paint line restriping • $70,000/mile	• in worst case: curb relocations • increased painting • tree impacts • drainage ??? • up to $1 million/mile, could be reduced if parking or traffic lanes removed	• separate paths displace existing sidewalks? • $ ¼ million/mile ∀
Implementation Issues	• education of motorists on how to "share the road"	• bus stops and driveways	• which side of road? • driveways and intersections • pedestrians

Conclusion/Rationale:

Where few driveways/intersections and moderately low speeds, go with bike lanes. Where many driveways/intersections/pedestrians just share the road, and, promote via signage along major corridors.

D. Cyclists

2. Parking - LONG TERM

Bicycle theft is a major deterrent to bicycle use at UBC. Many cyclists ride bicycle worth $500 to several thousand dollars, and understandably are concerned about the high rate of theft on campus. In order to encourage greater use of bicycles, secure bicycle parking is required. Where should this parking be located, what types of parking are most cost-effective and efficient, and what should this parking cost to use?

	Racks	Central Lockers	Racks with Secure/Indoor Areas
Description	New buildings only require outside racks	New buildings require racks plus cash to buy more central lockers	New buildings provide racks plus on-site lockers and showers
Pro's	• simplest, most adaptable treatment • lowest cost	• UBC takes over a revenue source to enhance TREK Card business plan • central lockers lend to more efficient admin.	• meets need on site • more convenient • more visible • spreads culture
Con's	• not encouraging • not consistent	• more administration • may violate existing AMS/UBC agreement for PPP	• useable only by that building • adds premium to building cost of approximately $___/stall • may be underutilized • budget cut risk • how to predict needs
Costs	• $500 –$1,000/rack	• $500 – $1,000/rack • Lockers: $3,000/each	• $_____/stall • $_____/shower • maintenance/change room (may be able to save by combining with washroom)
Implementation Issues	• aesthetics/location	• aesthetics, location • administration	• personal security • maintenance

Conclusion/Rationale:

Cash-In-Lieu: Less space demands and more administrative/user flexibility. If space permits, may want to promote several bike locker park and change/shower locations on campus.

D. Cyclists

3. Education and Enforcement - SHORT TERM

A comment frequently made regarding cyclists is that they don't obey the rules of the road. This creates resentment towards cyclists among other road users, and can cause accidents, often with serious results. How can we educate cyclists to ride safely, and other road users to share the road with cyclists? Are enforcement measures appropriate to support education efforts?

	Status Quo	Free/Low Cost Workshops	Can Bike Courses
Description	Each to his/her own RCMP on complaint	Invite workshops on campus, brochures	Use TREK Card to reduce course costs
Pro's	• simplest, lowest cost to administer	• initiates partnerships • strives to increase awareness/education while minimizing costs	• direct promotion and incentive • more control over frequency/location of the course • addresses concerns that no much in TREK for bikers
Con's	• doesn't address need to increase awareness/compliance with safe cycling habits	• no financial incentive to educate yourself	• increases TREK Card cost • transit/parking users subsidizing bicyclists
Costs	• health care costs • nothing direct to UBC	• brochures • ads • honorariums	• $???/course • $5,000 subsidy per year adds 25 cents/TREK card
Implementation Issues	•	• events planning/PR	• organize/ads/admin for each course

Conclusion/Rationale:

Courses: Adds nominally to the TREK Card cost, yet provides added value for cyclists to purchase TREK Card. Limit courses to 2/term of 10 students each at $100 subsidy.

D. Cyclists

4. Coordination - SHORT TERM

As UBC implements the bicycle components of the UBC Transportation Plan, coordination will be required to bring together all stakeholders on campus, and outside agencies such as the City of Vancouver, the Ministry of Transportation and Highways and the GVRD. How best can this be coordinated, and who should be involved?

	Status Quo	UBC Bike Club	UBC Bicycle Advisory Committee (BAC)
Description	TREK program TAC, GVRD, MoTH	Plus a user group	Reports to TAC/TREK
Pro's	• major stakeholder agencies who control provision and maintenance of facilities • already in place	• more sensitive to user issues with users involved • requires only a couple of club reps be involved	• seems to be more than enough interest to do this • would invite widest bicycle lobby input • most sensitive liaison
Con's	• no users actually involved • without user involvement, risk of issues being under-represented	• bike clubs have their own agenda • may not b formal enough a structure for TAC to take seriously • one club exists today	• another committee risks process slow down
Costs	• no new	• club sponsorship?	• administrative (meetings, minutes but likely nominal other than staff time)
Implementation Issues	•	• encouragement of club establishment	• solicit/establish BAC • administrative maintenance

Conclusion/Rationale:

Bicycle Advisory Committee: UBC needs to hear more from its user groups. The risk of added administrative costs would be offset by the benefits of improved liaison.

D. Cyclists

5. Public Bikes - SHORT TERM

Many people have proposed a "public bike" program on campus, whereby bicycles are available for free or for a refundable deposit for trips within UBC. Similar programs have been started in a number of communities across North America. Unfortunately, almost all of these programs have ceased operation for one reason or another. Is there sufficient interest and need for such a program at UBC, and how can it be managed so as to ensure it is successful?

	Free	Student Society	Copenhagen Model
Description	No locks Free use	$f20 cost to acquire Used bikes, students help	Shopping cart locks Corporate sponsor
Pro's	• most accessible • could use existing bikes/racks	• student driven • users "buy" the bike and motivated to take care of investment via bike lock • closest to self-sustaining • may get B.E.S.T. help	• easy to administer • quick start up • aesthetics better • virtually free • lowest cost to UBC
Con's	• maybe highest cost to administer • other cities have done this and failed as vandalism is high • would need more bikes • need a maintenance and shuttle to "balance" bikes at locations throughout UBC	• money involved increases admin. • locations for office/staff • volunteer recruitment	• need a shuttle to bring back bikes • not self-sustaining • need to make a connection • high capital cost for locks, new bikes and maintenance
Costs	• bikes free from housing • repairs • shuttling/recovery	• repair shop (could reduce via B.E.S.T. partnership) • cashier, records annual reports (may want to form an AMS society)	• $3,000/lock • $500/bike • Minimum 1,500 bikes
Implementation Issues	• bike recovery/maintenance	• obtain AMS/GSS endorsement • solicit volunteers • negotiate B.E.S.T. partnership (B.E.S.T. may also be able to administer—many of its members are UBC students/staff and faculty)	• staging via pilot locations • solicit sponsorship

Conclusion/Rationale:

Student (B.E.S.T.?) Society: This public bike program has great potential but will flounder without "buy-in" from users. Costs could be minimized via volunteers, individual nominal investments and partnerships.

E. Car/Vanpooling - A LONG TERM ISSUE WITH SHORT TERM OPTIONS

Vanpools are groups of seven or eight commuters, who commute together on a daily basis using passenger vans. Vanpoolers pay a monthly fare which covers the cost of the van, gas, insurance and maintenance. Generally, vanpool fares represent a savings compared with driving when commute distances are 35 km or longer, such as from Langley to UBC, for example. Currently, there are approximately 100 vanpools operating in the region, and 20 of these travel to and from UBC each weekday.

Carpools can be formal arrangements like vanpools, where the same people commute together each day, or can be informal arrangements for as little as one day. Carpools range is size from two persons (the driver and one passenger) to five or six persons, depending on the size of vehicle. Carpools use vehicles which are privately-owner, rather than vehicles provided by another agency (as is the case with vanpools).

Overall Data:

- There is a Jack Bell car/van pool rep on-campus available for consultation and getting involved; for more information, call 341-RIDE or 879-RIDE weekdays.
- Trip Reduction Bylaws - *Montgomery County*, suburb of Washington DC… personalized ridesharing assistance, shuttle van services, transit pass subsidies and other measures. This ordinance has achieved a 31.7% increase in the number of carpools and a 59.6% increase in transit commuters within just one year.
- … with two-person car-pools getting a 50 percent reduction, three-person car-pools 75 percent, and van-pools 100 percent, *Seattle* has achieved 95 percent high-occupancy vehicle use in public spaces and 35 percent in private spaces." (Totten 1989)
- users of car-sharing (related to ridesharing) are most of the time ex car owners. Actually, it is often the second car which disappears. So, this means less cars in parking lots,
- the amount of kms (miles) driven in car-sharing is about 15% less than with a private automobile (previous owners). This results from the large increase in marginal cost of the shared-car (largely offset by the low annual investment). So, often, users prefer to walk or bicycle or use mass transit.

Further data needed
Data Needed: Counts on permits/pools
Map: Vol's/Categories of van poolers

E. Car/Vanpooling

1. Ridematching - SHORT TERM

The main difficulty which prospective carpoolers and vanpoolers encounter is finding partners to share the commute. A ridematching service helps to find partners by creating a database of potential car/vanpoolers, and matching compatible commuters. However, not everyone who wants to can be matched, and many potential matches do not work for one reason or another. How can UBC provide a ridematching service, and what can UBC do to maximize the number of matches?

	Status Quo Remote Program	Flexible Work Hours	On UBC Campus Program
Description	Status quo – nothing formal other than monthly through Jack Bell	Staff can vary work hours, must be present during core period (typically 9 a.m. to 3 p.m.)	TREK Program office to establish daily e-mail/phone-in Registration/clearinghouse
Pro's	• established program • no cost to university	• Would allow shift in hours to allow pooling • increase ridesharing potential in support of OCP	• larger pool of potential riders to match from • greater incentive to participate than Status Quo • lower costs for participants • already in place part time
Con's	• not a large enough program to attract significant number of riders • questionable benefit/ support for OCP	• concerns over coverage and work planning	• start-up and maintenance costs required • liability issues/concerns WRT matching up participants
Costs	• Lowest	•	• Highest
Implementation Issues	•	• Need to plan for week to week hours to ensure coverage	• Web site, computer program (could partner with Jack Bell)

Conclusion/Rationale:

On Campus Program - Start with on-campus Jack Bell support person (already in place). As program builds, monitor needs for more flexible work hours and report back as a "next phase" in promoting car/van pooling.

E. Car/Vanpooling

2. Marketing - SHORT TERM

Carpooling and vanpooling only works when people are aware that it is an option. How can UBC promote carpooling and vanpooling, and support car/vanpooling efforts?

	Status Quo	Events Oriented	Aggressively Promote
Description	Jack Bell, off-campus People phone in	Jack Bell off campus database Pursue opportunities on campus to participate in events	Integrate with TREK office On-campus Jack Bell office/computer database Web, email, phone
Pro's	• Existing program has worked well	• "Piggybacks" on others PR • improved marketing and OCP support	• easy to set up and maintain • builds on existing Jack Bell • will reach many more people
Con's	• Currently only 20 vans at UBC; • Car pools need more aggressive promotion	• requires more manpower and time • still not actively getting the word out	• costly, may only be needed in the short term
Costs	• Lowest cost	• moderate, but likely done by Jack Bell	• highest, but most sustainable
Implementation Issues	•	•	• office space

Conclusion/Rationale:

Aggressively Promote - Jack Bell Foundation is gearing up for an aggressive car/van pool program marketing initiative. UBC only stands to gain by being part of it, especially as there is now a full time (3 days per week) Jack Bell staff person dedicated to UBC each week.

F. Transit - A LONG TERM ISSUE

Nearly 20,000 people take buses to/from UBC each day, utilizing ten different service routes and 160 buses arriving in the peak periods. If UBC is to reduce SOV use, the backbone of incentive programs will be improvements to transit service. BC Transit are at near capacity in UBC service on the major service routes and without added funding cannot commit to improvements necessary to realize a 20% ridership increase.

With the advent of the Greater Vancouver Transportation Authority (GVTA) expected this Spring, funding will likely cease to be an immediate constraint, but any new buses ordered will still take a year to arrive to improve service.

BC Transit are looking at a number of other service enhancement initiatives which will impact UBC riders, including:

- bikes racks on the 99 B-Line in the Fall 1998
- electronic fare boxes that will allow the use of SMART card technology

Negotiations are underway with BC Transit to determine how the UBC TREK Card and TREK Program can fit into BC Transit plans to improve UBC service and yet still keep BC Transit revenue neutral.

Overall Data:

- At densities of 50-60 employees per acre, an estimated 6-11 percent of employees will ride transit.
- Preliminary data suggests that expenditures on transit provide approximately 3 times the number of jobs as automobile expenditures in general, and about 7 times as much as expenditures on petroleum. This is not surprising since transit service is quite labor intensive, while vehicles and petroleum are capital intensive. (Todd Littman)
- Go Green Coordinator's - BC Transit offers a course on Go Green Employee Transportation Coordinators for agencies wishing to promote "Go Green" initiatives. The course includes manuals with many practical tips and how to's on setting up a program for employees. The contact is Karen Halex at BC Transit at 540-3452.
- Cost of an annual 1 zone bus pass is $567 with the employee payroll deduction discount
- Students may pay $2 to upgrade monthly1 zone transit passes to 3 zone.
- Transit passes may be purchased at the SUB and the Village Pharmacy, and are being considered for sale at the UBC Bookstore and UBC Parking & Security office

Further data needed
Data Needed: OCP units/schedule
Current BC Transit rev.
Potential for other bus pass sales locations

Diagrams: All routes to UBC, travel time
Staff/faculty/students mode split

F. Transit

1. Transit Capacity - SHORT TERM

During peak periods, the majority of transit buses traveling to and from UBC in the peak direction are at or near capacity, and on many of these buses, there are standing loads. If UBC is to achieve its goals of reducing automobile use and increasing transit use, additional transit capacity will be required to carry additional passengers. This can be accomplished by BC Transit providing additional buses and/or by UBC adjusting class schedules to reduce the peak demand. Should one, the other or both be done?

	BC Transit Adjust existing buses	**Shift UBC Schedule Re-focus classes to 8 and/or 10:00 am**	**BC Transit Add more buses Leave UBC as is**
Description	• Tuesday, Thursday (more) • Monday, Wed., Fri. (less) • look at daily traffic (ridership) volumes – is it appreciably different? • current loads/scheduling? are they lighter on Tuesday and Thursday?	• ½ hour earlier later not a major change • will not require extensive additional costs in support staff • supports OCP with minimal cost to UBC	•
Pro's	• doesn't extend staff hours	• earlier finish and start • HOV runs 6 – 9, would take advantage • no additional buses – calculate load reduction and take to BC Transit • experience at other institutions is favorable • many professors would prefer earlier end	• will happen in any case • lowest cost to UBC.
Con's	• more trips, less carpooling • scheduling nightmare may result unless extensive, clear communication • may exacerbate problem in the long term	• darkness – security concerns • students don't prefer early classes • some support staff will need to start earlier	• slower to realize capacity improvements • not seen as doing our part to support OCP/BC Transit
Costs	• Mostly BC Transit	• Mostly administrative	• Highest, if UBC must pay for additional buses sooner
Implementation Issues	• BC Transit scheduling	• How to reschedule classes - by faculty? by year? undergrad? all? choice?	•

Conclusion/Rationale:

Shift UBC Class Schedule - UBC will be seen as doing its part while BC Transit capacity will also increase over the next few years. Promotes OCP and BC Transit. Similar models have proved successful elsewhere, with many people preferring to start/finish earlier to have more of their day left to do other activities.

F. Transit

2. Service Reduction Periods - SHORT TERM

During holidays and summer months, BC Transit reduces service levels at UBC. This makes sense to reduce needless expenses in slow periods and plan for its use in peak periods. For persons who remain on campus, however, this makes it more difficult to travel by transit - is more UBC consultation/liaison needed? What can be done to plan sensitively during these times to improve mobility for trips to and from campus, and yet ensure people don't resort to driving?

	Status Quo	More UBC Input
Description	Status quo, leave to BC Transit, no UBC input	UBC requests, based on staff/TAC requests
Pro's	• BC Transit saves money	• some improvement in access to transit
Con's	• no service improvement provided to UBC	• additional cost may need to be assumed by UBC • service may be too limited to accommodate potential users • could do via a UBC Transit Liaison Committee
Costs	• Lowest	• Administrative - less for BC Transit, more for UBC
Implementation Issues	•	• Incorporate as Terms of Reference for UBC Transit Liaison Committee

Conclusion/Rationale:

More UBC Input - To protect UBC rider interests and assist BC Transit in being responsive to UBC needs which may change over time and throughout the year. Added administrative UBC costs could be offset by coordinating liaison through an ongoing UBC Transit Liaison Committee.

F. Transit

3. Transit Terminals - LONG TERM

The existing bus loop near the SUB and bookstore is approaching capacity. It also occupies a prime future development location. Should it remain where it is and be expanded or incorporated into a new development, or would it be better to be relocated elsewhere? Also, additional new bus terminals will likely be required on campus, especially south of 16th Avenue as development occurs in this area.

	Status Quo	Redevelop	Relocate
Description	Status Quo	Redevelop overtop	Move on street
Pro's	• low cost option • maintain existing routes • central location	• do not need to acquire additional site • traditional location for users • increases marketability of site with good access • supports OCP • consistent with other exchanges in GVRD	• low cost option • makes use of existing space • supports OCP
Con's	• finite capacity will be exceeded soon • High impact on aesthetics, ability to redevelop surrounding areas • could work against OCP	• disrupts existing service during construction • expensive, but could be offset partially by increased development • site may not be large enough • Constrains development area	• disrupts traffic flows on street (traffic calming effect?) • may impact operations of transit vehicles • loss of on-street parking • BC Transit does not support unless compact, bus-only on-street area
Costs	• Lowest capital, highest OCP impacts	• Highest, but with potential for reductions	• Moderate
Implementation Issues	•	• Design for large buses, venting	• Elimination of traffic on University Boulevard • Bookstore access

Conclusion/Rationale:

Redevelop - This makes OCP and financial sense. Similar to working models elsewhere in the GVRD. Plan for a similar concept near Wesbrook/16th as the south campus develops.

F. Transit

4. Shuttles (see also Getting Around Campus) - SHORT TERM

Currently, the only means of traveling around campus are walking, cycling or driving. A shuttle service operates in the evening, but not during the daytime when it would be useful for students and faculty rushing between classes at far ends of the campus, for example, or for visitors unfamiliar with the campus. Is a shuttle needed on campus during the day?

	Status Quo None in Daytime	**Use Existing**	**More**
Description	Use other means, not BC Transit	Use existing UBC shuttles	Acquire extra shuttle buses or use BC Transit vehicles to accommodate additional demand
Pro's	• Leaves transit at loop • Less vehicles in core	• cost savings	• quick access across and throughout campus • increased security
Con's	• does not address shuttle needs	• existing resources may not be enough, unless limited to special needs users • service could be provided by other means (e.g. Vans)	• additional capital and operating costs • on campus vehicle intrusion, pollution, noise issues • questionable OCP support • BC Transit does not support
Costs	• Lowest	•	• Highest
Implementation Issues	•	• Over demand addressed how? • Additional staff, vehicle maintenance	• Fleet management

Conclusion/Rationale:

Use Existing - Start with existing shuttle bus, but limit to users with special needs and observe demand. Expand to other user groups as capacity/TREK funding permits.

F. Transit

5. Public Information/Marketing - SHORT TERM

It is difficult for many people traveling to and from UBC to obtain information regarding routes and services. BC Transit's public information telephone number (521-0400) is frequently busy. Schedules are difficult for some people to read. And the transit map costs $1.75, and is only available from a limited number of locations. What can UBC do to improve access to and the usefulness of public transit information?

	Status Quo	Aggressively Promote
Description	Phone line, UBC transit map, web site, posted at bus stops	Real time information at stops Improved phone access More and/or Free transit maps at more locations around campus, by fax More transit fare dealers on campus
Pro's	• Single source of information for all transit services to/from UBC • Can be widely distributed free of charge • inexpensive • UBC already has partial schedule on web site • potential to be accessible to all students/staff	• More responsive to customer needs • Works toward getting info closer to step at which trip planning occurs - at class/work/home • Could also sell fare cards at Bookstore, Parking/Security • BC Transit is working toward real time information at loops
Con's	• may not be fully utilized or accessible by students/staff • not proactive in supporting OCP • subject to vandalism/theft • only accessible at stops and not where trip planning step may occur	• Significant expense to subsidize maps and distribute, but could be done on request only
Costs	• Lowest	• Moderate
Implementation Issues	•	• Real time scheduling requires Global Positioning software

Conclusion/Rationale:

Aggressively Promote - Trip makers need to be more aware of the options, services that BC Transit has to offer, to facilitate mode split shift. This could be a key part of the Terms of Reference for a UBC Transit Liaison Committee.

F. Transit

6. Coordination - SHORT TERM

Providing transit service is currently the responsibility of BC Transit. How can UBC best coordinate the planning, operation and monitoring of transit services with BC Transit, so as to ensure that transit services are designed to meet users' needs, and that problems are quickly addressed?

	Status Quo	UBC Transit Committee
Description	Status quo – UBC staff and Transportation Advisory Committee (TAC)	UBC Transit Committee – BC Transit, RCMP, UBC, AMS, GSS, riders not just agencies, max'm 8 people
Pro's	• less bureaucratic • already have	• could make a subcommittee of TAC • greater representation • more focused, smaller group •
Con's	• less representation • large group dealing with many issues • not focused on transit priorities - conflicting interests/priorities with other TAC matters	• needs to be sensitive to 'big picture' issues
Costs	• low	• low
Implementation Issues	• administrative resources	• administrative support • keeping workable size

Conclusion/Rationale:

UBC Transit Committee - Solicit local UBC transit users and choose a representative committee of a good working size, with agency support as appropriate.

F. Transit

7. LRT - LONG TERM

BC Transit is currently planning a light rail line along Broadway and Lougheed Highway, from Granville Street in Vancouver to Coquitlam City Centre. Based on a transportation planning rule of thumb of 5,000 trips in the peak hour, there appears to be near sufficient demand to justify a closer look at extending LRT to UBC. The earliest projected time LRT might be in place at UBC would be at least 10 years away. How can UBC lobby for it? How should it be funded?

	Support LRT to UBC	**Partner LRT to UBC**	**Status Quo: Expresses No LRT to UBC**
Description	Support	Support strongly, including funding part of UBC station	Stick with 2021 plan for express bus only
Pro's	• encourages higher ridership • shorter trip times • supports OCP to reduce trips, pollution, congestion	• encourages higher ridership, supports OCP • shorter trip times • infusion of UBC money may speed up process • would work well with new residents to induce transit	• less expensive • can be as effective as LRT
Con's	• high property impacts • long term improvement	• very expensive, especially for UBC • long term improvement • Use of Endowment Fund for non-academic purposes, but could recoup via development rights	• on-road congestion can create delays • corridor impacts include noise and pollution and loss of on-street parking
Costs	• low	• Highest at least initially	• moderate when congestion and community considered
Implementation Issues	• alignment selection • consultation	• Negotiation strategies • UBC control in return	• More buses needed, when •

Conclusion/Rationale:

Support LRT to UBC in support of OCP and Regional trip reduction, air quality goals.

G. Telecommuting - A LONG TERM ISSUE

Telecommuting can help to reduce vehicle traffic to and from UBC. Communications and computer technologies make it possible for many people to work and study at home, one or more days per week. This could have a significant impact on traffic volumes at UBC; however, it is a brand new mode of working and studying and requires due diligence in development of policies and procedures. Few other major institutions in the GVRD have implemented telecommuting - it will likely be at least five years before corporate cultures and technology promote telecommuting in any significant way.

Overall Data:

- California (CALTRANS) is a leader in telecommuting
- BCGEU has developed and implemented a model telework (i.e. telecommute) policy
- productivity gains from telecommuting come from an average 7 less interruptions per hour, allowing greater concentration
- only 20% of people tend to telecommute for various socioeconomic reasons (e.g. wishing to socialize at work, or, toddlers at home preclude work at home)
- of those that do telecommute, 15 to 20% elect to change their commute modes from SOV to transit, thereby able to sell off the 2nd car and reducing the parking stall demand

Further data needed
Recent studies on productivity increases
Sample business plans
Model policy from BCGEU

G. Telecommuting

1. Logistics for Staff/Faculty (i.e. Tele-work) - LONG TERM

How can telecommuting be managed so as to be beneficial for all persons involved ? staff, students and UBC? What technologies are needed? What policies are required?

	Status Quo	Promote
Description	Status quo – no formal policy, left up to individuals/ supervisors/ union consent on specifics of each case	Formalize policy
Pro's	• discretionary nature of application may be more effective to select "appropriate" individuals	• higher participation rates • formal guidelines for participation that can be consistently applied • clarifies, removes guilt • supports OCP
Con's	• lower participation rates • no consistency in application	• greater administrative responsibilities • technological investments may be required
Costs	•	•
Implementation Issues	• union consent • technology commissioning	• policy development/sign off by all • technology commissioning • educational programs • monitoring issues • equity issues

Conclusion/Rationale:

Promote - Many employees already promote tele-working within their office; formalizing the policy would help managers/employees/unions deal with requests on a consistent basis, with formal program to promote. Would reduce traffic and parking, in support of OCP.

G. Telecommuting

2. Distance Education (i.e. Tele-courses) - LONG TERM

UBC is undergoing a visioning process about the way we do education in the coming 100 years. Access, technology, economics, age and competition are all contributing to a review of what sort of learning (research and academic) institution UBC plans to be - distance learning - should it be maintained or expanded? Many feel that some on site teaching is a necessary part of the learning experience. Recent research suggests that of three classes per week, perhaps only one class need be attended in person. This would lead to an immediate roughly 50% reduction in traffic (on average)! This may perhaps be the most inexpensive way for UBC to reduce traffic, but is it a made in UBC solution? What technologies are needed? What policies are required?

	Status Quo	Promote
Description	Status quo – no formal policy, left up to individual faculties to decide on specifics of each case	Formalize policy
Pro's	• discretionary nature may be more effective to select "appropriate" individuals	• higher participation rates • formal guidelines for participation that can be consistently applied
Con's	• lower participation rates • no consistency in application	• greater administrative responsibilities • technological investments may be required
Costs	•	• technology
Implementation Issues	•	• technology hurdles - would need to ensure everyone has the same systems so they can 'talk' to each other/professors

Conclusion/Rationale:

Status Quo - pending President's visioning process outcome. Consider promoting only so long as it does not jeopardize the UBC learning process/experience and corporate direction.

H. Trucks - A SHORT TERM ISSUE

Trucks are a small but significant component of the traffic traveling to and from UBC. Recent traffic counts indicate that approximately 750 trucks travel to and from UBC on a typical weekday, which represents 1.1% of all vehicles. These trucks range in size from two-axle "single-unit" delivery trucks to eight-axle B-trains.

Although it is difficult to relate data to on-campus construction activities, UBC did come through a period of high activity in 1986/97 with resultant construction truck volumes likely higher than usual as a result.

Unfortunately, one truck creates far more negative impacts than one car. Residents who live along routes used by trucks are affected by noise, vibration and air pollution from trucks.

Overall Data:

- UBC Dr. David Bates notes that the particulates in diesel exhaust from trucks have been linked to increased incidence of cancer
- There are an estimated 40,000 trucks and buses in the Lower Fraser Valley. In a voluntary emissions program for heavy duty trucks that started in 1996, the failure rate was 20% out of 2,500 trucks tested. Heavy vehicles produce about one-quarter of the nitrogen oxides and almost half the primary particulates emitted by all vehicles on BC roads. Mandatory emission testing begins in September 1998. (Source: BC Ministry of Environment news release)

Further data needed
Data Need:

Couriers per day to UBC
Predominant truck origins to UBC (i.e. Richmond?)

Map: Truckroute map for CoV

H. Trucks

1. Truck Routes - SHORT TERM

The City of Vancouver designates certain roadways for use by trucks. These include Marine Drive, 41st Avenue, 4th Avenue, and Broadway/10th Avenue. What can UBC do to create additional route opportunities for trucks, or, are there ways to more evenly distribute existing truck traffic?

	Re-distribute	Status Quo
Description	Map needed, support all routes Contractual provisions	Status quo
Pro's	• greater dispersal of trucks throughout all possible routes • less impact on specific routes	• no "new" routes will be established, minimizing impact on other communities
Con's	• some routes will continue to carry heavy volumes of trucks • potential to impact routes not able to handle truck traffic (i.e. noise, vibration, pavement quality)	• current situation allocates all trucks to only a few routes which is unacceptable to the communities impacted by these routes
Costs	• Highest	• Lowest
Implementation Issues	• How to legally require • Benefit trade-off versus cost premiums	• Resident complaints

Conclusion/Rationale:

Stick with status quo until further data available of truck origins and what legal avenues there are to monitor and/or force carriers to use routes more evenly. (e.g. different arrival/departure routes)

H. Trucks

2. Construction Traffic Management - SHORT TERM

Construction generates considerable truck traffic, particularly large trucks. Are there opportunities to increase recycling, reduce waste, control travel times and coordinate delivery/storage facilities on-campus, so as to minimize off-campus truck traffic?

	Contractual	Scheduling	Status Quo
Description	General Condition Construction Contract Clauses on hours, routes	Construction scheduling	Status quo
Pro's	• legally binding • penalty recourse possible	• truck movements that are compatible with surrounding traffic patterns and land uses	• no impact on construction process
Con's	• penalties have been tossed out of court in the past • requires monitoring	• may slow construction process and frustrate construction companies	• erratic schedules will continue to conflict with local traffic and land uses • does not support OCP
Costs	• depends on degree of monitoring	• highest	• lowest
Implementation Issues	• monitoring • penalty clause	• scheduling	•

Conclusion/Rationale:

Make a contractual condition of trucking contracts, with preferred contractor status based on undertaking and/or letter of undertaking from trucking firms to comply/agreement to penalties for non-compliance.

H. Trucks

3. Goods Movement - SHORT TERM

Moving goods to, from and within UBC is an important and costly component of daily operations. What can be done to improve the efficiency of goods movement on campus, as well as to and from campus?

	Prerequisite	Incentives	Status Quo
Description	Purchasing clauses on hours, routes, vehicle safety, vehicle pollution control measures	Incentives/Rewards for minimization of truck volume/size	Status quo
Pro's	• enhances safety and environment • minimizes hours of truck operation	• places onus on the carrier to reduce impacts without constraining their operations • addresses OCP	• system already in place to administer and manage
Con's	• more effort required to administer • may constrain operations of carriers	• may not elicit a significant change in behavior	• continued practices may result in further negative traffic and environmental impacts • does not address OCP
Costs	• highest	•	• lowest
Implementation Issues	• Monitoring, inspection of vehicles • Finding correct balance between contractual reqmt's and cost premium	• self-monitoring checks • designing effective incentives	•

Conclusion/Rationale:

Try incentives initially, with voluntary pre-requisites. Occasional monitoring to assess effectiveness. Move to pre-requisites if needed.

H. Trucks

4. Coordination - SHORT TERM

What can UBC do to coordinate and manage truck traffic? What departments should be involved in coordination of truck-related activities?

	UBC Warehouse	Coordination	Status Quo
Description	UBC Warehouse	IS Network/Clearinghouse through Purchasing/Plant Ops only, keep separate storage/deliver facilities	Status quo, each to his own
Pro's	• central shipping/receiving area will reduce number of trips to/from and throughout campus by trucks	• more efficient distribution of goods	• shipping and receiving of goods is direct
Con's	• internal goods movement operations will need to be upgraded	• greater administrative responsibilities for purchasing/plant operations	• no reduction in trips will be achieved
Costs	• lowest in long term • highest initially	• moderate	• moderate
Implementation Issues	• administrative boundaries • paperwork coordination	• administrative systems	•

Conclusion/Rationale:

Coordination - In the short term, work towards better coordination of shipments. As departmental administrative boundaries lessen, work towards total integration and a UBC warehouse set-up.

I. Roads - A SHORT TERM ISSUE

Roads at UBC have come full circle. In 1922, a herd of pedestrians wore in the first paths. Grand plans and vehicles lead to the creations of divided highways with wide, landscaped boulevards. Noise, fumes and congestion lead to vehicle restrictions and more pedestrian campus areas. Growth pressures and campus sprawl have tempered these restrictions, leading to the current hybrid land uses - a pedestrian core, surrounded by perimeter vehicular areas. Hence, most of UBC roads north of Thunderbird and within the Marine, Wesbrook perimeter are pedestrian dominated, where the auto is the visitor and the pedestrian the norm.

As UBC continues to grow and develop under it's new OCP, densification and intensification of uses will occur, leading again to pressures for increased traffic. How can this additional traffic be controlled, routed and calmed to maintain the sense of place we have come to treasure?

Overall Data:

- Gridded systems provide the easiest pedestrian access, while cul-de-sacs, popular in suburban developments, restrict transit and pedestrian passage
- … Dutch cities like ***Delft, Groningen,*** and ***Maastricht*** have calmed traffic by changing the layout of the residential street, transforming it into *woon erf*, or "living yard." In the *woon erf*, cars are forced to navigate slowly around carefully placed trees and other landscaping.
- Wherever traffic calming has been conducted on a large scale the urban area has found, contrary to many economists' predictions, that the local economy has improved. This appears to be because people like to come to attractive, green cities; businesses like to locate in cities with a high-quality urban environment; care access is not banned but it is not facilities; and other modes are generally facilities. (see Lowe 1991a; FOE/UK n.d.; Newman 1991)

Further data needed
Data Needed: Survey results, IS inventory
Demographics - income
Diagrams: demographics versus origins
Map: Travel times versus modes
Map: Major road map

I. Roads

1. Control of Roads - SHORT TERM

All roads leading to UBC through Pacific Spirit Park (i.e. west of the City of Vancouver) are controlled by the Ministry of Transportation and Highways. Although this reduces maintenance costs, UBC has no effective control over these roads for improvements to illumination, intersection controls, bicycle lanes, on-street parking and so forth, not without prior consent of the Ministry of Transportation and Highways. Discussions between the GVRD and Province may further complicate or resolve this issue if/when a regional road authority assumes control of some or all of these roads.

	UBC Takes Over All Roads Abutting	**MoTH Keeps Residual**
Description	GVTA takes some UBC takes the rest	GVTA takes over some MoTH keeps the rest
Pro's	• we control ⊆ parking, bicycles, pedestrians, lighting ⊆ traffic management ⊆ upgrades	• cost savings
Con's	• cliff erosion/road support • high maintenance costs and upgrade	• few if any upgrades
Costs	•	•
Implementation Issues	•	•

Conclusion/Rationale:

UBC Takeover - Take a cautious approach of assuming road controls where long term costs are less than benefits of increased control. Need a geotechnical review of Marine Drive stability to confirm long term costs.

Data Needed:
- annual MoTH road maintenance costs
- estimate of upgrade needs/costs for MoTH roads

I. Roads

2. Road Hierarchy - SHORT TERM

Roads are classified according to their function. Major/arterial roads are designed to carry through traffic, and local roads are designed to provide access to adjacent buildings and properties. These classifications become a road hierarchy. Are changes required to road classifications on campus, and what classifications layout should be used for new roads south of 16th Avenue?

	Strong supporting Grid	**Cul-de-sacs**
Description	Neo-traditional - grid	Cul-de-sacs
Pro's	• more efficient traffic flows • more effective use of land area • pedestrian, transit and cyclist friendly • promotes OCP	• protects from through traffic • promotes pedestrian malls
Con's	• may not discourage SOV use in some cases	• does not favor non-SOV modes ⊆ transit ⊆ cycling ⊆ walking • concentrates traffic at key intersections, may result in congestion/delays • reduced connectivity
Costs	• existing layout north of 16th • higher cost south of 16th	•
Implementation Issues	•	• choice of streets to block off

Conclusion/Rationale:

Supporting Grid - Neo-traditional, grid type roads promote transit, bikes, peds

I. Roads

3. Traffic Calming - LONG TERM

Traffic calming is an approach used on local and collector roads to reduce vehicle speeds, reduce traffic volumes or reduce conflicts. UBC has implemented some traffic calming measures, such as speed humps and raised intersections. Are more traffic calming measures needed, and if so, where?

	Aggressive	Proactive	Status Quo
Description	Intensive, pro-active, campus-wide with annual budgets	Reactive, complaint basis	Status Quo
Pro's	• reduction in traffic and speeding in short time frame • promotes ped/bikes/OCP	• responds to community requests • could tie to local area planning process • promotes OCP	• balanced with current resources
Con's	• may impede non-SOV modes in some cases (i.e. buses and bicycles)	• does not consider larger context of traffic calming and traffic flows • may shift problems to other locations • problems not reported are not addressed	• people don't speak up often enough
Costs	• moderate	• low	•
Implementation Issues	• where do you start?	• tie to local area planning process	•

Conclusion/Rationale:

Proactive - Implement as part of consultant reviews tied to comprehensive community planning process, when details on land uses better known.

J. Parking - A LONG TERM ISSUE WITH SHORT TERM OPTIONS

Numerous studies have shown a strong causal link between the ability to manage the demand for travel to/from a particular destination and the supply/price of parking at that destination. Whereas improved transit service is considered a "carrot" to discouraging SOV use, parking management policies are considered punitive or "sticks" to discourage SOV use (all auto use in fact). However discomforting this relationship is, it is a reality that must be considered in the university's policies.

The UBC OCP Bylaw 1997 clearly states that parking prices will be increased to reduce SOV trips to UBC - the issue is then by what degree. If other programs are found that work in concert, parking prices need only be increased to cover inflationary-related expenses and those other programs (i.e. the TREK Program).

Meanwhile, no new parking is being contemplated at UBC at this time. As buildings are built, surface parking lots become classrooms.

Overall Data:

- recent research indicates that reducing the parking supply ratio to 1 stall per 4 employees encourages a 30% transit mode share where transit is available
- more than parking price increases, limiting the supply of parking stalls has been found to be the most equitable and effective parking management tool
- A 1990 paper drafted by the staff of the Maryland-National Capital Park and Planning Commission as part of the Planning Department's Comprehensive Growth Policy Study examined the links between trip reduction and affordable house: More residents of multi-family housing do not know that they are paying approximately $50 a month for each parking space. Requiring landlords and condominium associations to price housing and parking separately would spur some people into giving up cars. It would also make the average rental unit in the Country 8-9% more affordable for those without cars.
- The (Federal) Government increased its parking rates for federal employees in Ottawa, resulting in a 23 percent reduction in employee driving to work, a 16 percent increase in transit ridership among federal employees, and an increase in average vehicle occupancy from 1.33 to 1.41 passengers
-

Further data needed
Maps: Parking lots,
for UBC Parking & Security, and for
UBC Housing, and for GVRD Parks, and
for MoTH on-street
Tables: numbers, prices - for above - see Parking Business Plan in Budget

J. Parking

1. Carpools - SHORT TERM

Preferred parking ? locations close to major destinations and/or reduced parking prices ? is an important incentive to carpool. How can preferred parking be provided for carpools, many of which operate on an informal basis, without allowing abuse and without imposing cumbersome requirements?

	Free	Status Quo – Subsidized	Full price
Description	All car pools park for free	• Minimum 3 people to qualify • 50% of permit cost	Normal permit
Pro's	• sends direct message • could link to TREK card, so in effect not free	• current policy • violation rate is relatively low	• encourages/evens playing field • no incentive to cheat
Con's	• goes against UBC OCP policy to increase parking prices • encourages cheating • no way to enforce without more staff	• encourages cheating	• no message sent • hurts existing pools (about 200)
Costs	• additional enforcement	• no additional	• net revenue
Implementation Issues	• verification of 3+ pools • enforcement • fine collection	•	• less administration

Conclusion/Rationale:

Status Quo (initially) – Review again as part of annual TREK program implementation reviews. Keeps message in concert with TREK Program goals.

J. Parking

2. Vanpools - SHORT TERM

In order to encourage vanpooling, it would be desirable to provide parking close to commuters' destinations for the small number of vanpools operating to and from UBC. Where is vanpool parking needed? Should vanpools be charged for parking, and if so, how much?

	Free	Subsidized	Status Quo Full Fare
Description	No charge if all on TREK Cards	Half price Same price as car pools	Recognizes cost is cheap Give preferred locations
Pro's	• Jack Bell Foundation enforces pools via price structure so little risk of abuse • could link to TREK card	• consistent with car pools prices • sends a direct message	• in accord with OCP policy • preferred locations
Con's	• free parking against OCP policy, but this could be mitigated by requiring all to purchase TREK card	• not really consistent, as vans get preferred locations in parkades	• inconsistent with car pools parking permits
Costs	• 20 vans @ $600 ± = $12,000 lost revenue to be subsidized by other TREK Program users	• $6,000	• No charge
Implementation Issues	• all riders must have TREK Cards	• all riders must have TREK Cards	•

Conclusion/Rationale:

Status Quo (initially) – Cannot offer "free" parking. Eventually could link to TREK Card and make part of card cost, thereby in effect "free" as a hidden TREK Card cost..

J. Parking

3. Motorcycles - SHORT TERM

Motorcycles require less area to park than automobiles, and can be parked in many areas inaccessible to other motor vehicles. But although modern motorcycles emit less pollution than cars, older and/or out of tune motorcycles can pollute just as much. Currently, motorcycles are parked throughout campus in many "unofficial" locations; there is one motorcycle shed beside the North Parkade, and motorcycle parking permits are available. Is there a need for more "official" and/or preferred motorcycle parking? If so, where, and how can it be managed?

	Free	Preferred	Full Fare
Description	No charge to park; park with everyone else without preferred parking spots	Area taken = 1/5 a car therefore price = 20% a car, but still preferred parking locations	Same cost as other SOV's, preferred parking locations
Pro's	• promotes motorcycle use	• equitable • still encourages use	• Can pool • recognizes motorcycles still pollute
Con's	• may shift from bikes/bus to motorcycles, in conflict with OCP policy	•	• ignores spatial benefits • discourages motorcycle use •
Costs	• lost revenue	•	•
Implementation Issues	•	•	•

Conclusion/Rationale:

Go with status quo (preferred) and work on promoting preferred locations in unused areas of parkades/lots.

J. Parking

4. Housing - SHORT TERM

Parking is available for most residences on campus. Is there too little or too much parking available? Some residents without cars apparently rent their parking stalls to commuters. How can this be managed so as not to encourage single-occupant commuting, yet ensure that sufficient parking is available for residents who need it?

	Status Quo	Coordinate	Integrate
Description	1 Free stall with rental for family residences, 2nd at cost Totem, Vanier, Thunderbird pay Permits for on-street	Housing & P/T jointly set rates/enforcement attends	Show each stall as a separate charge on rent which can be opted out of
Pro's	• many students, staff, faculty own and need cars during more class hours	• better coordination campus wide to control abuses, neighborhood traffic/parking intrusion • confirm actual need versus supply • support TREK Program goals	• each building would be involved • additional revenue • need overall less parking • tighter control as residents give up their spot • recognizes time cost
Con's	• doesn't reflect/acknowledge the cost of parking facilities • no inducement to change travel behavior/auto ownership • doesn't recognize high number of family residents that do not own cars	•	• could be perceived as a penalty even though cars aren't driven during rush hour • penalizing non-SOV commuters • equity issue
Costs	• None	• may realize synergies and reduce costs of duplication	• initially will increase administration • in long term, may be able to reduce parking supply
Implementation Issues	•	• inventory • information sharing	• inventory • charge brochures • billing/payment procedure

Conclusion/Rationale:

Coordinate: All Providers of Parking on campus stand to gain from better coordination of services – monitor, administer, enforce, price, permits, planning. Ultimately, move to show cost per stall as a budget line item in budgets for each building, housing promote TREK Program goals of awareness, 24 Hour trip reduction.

J. Parking

5. Visitor - SHORT TERM

Many people visit UBC each day. Some stay for only 10 minutes, others stay half a day or more. Often, parking for visitors is not available, or is inconveniently located far away from their destinations. How can the various needs of visitors be met, in a way which does not encourage abuse by commuters?

	Free	Status Quo	Re-Imbursable
Description	Time restricted zones	Visitors pay full rate	Use revenue to give out transit ticket to those who choose bus
Pro's	• consistent with other areas • caters to vendors, business visitors who are short term parkers and generally don't travel in rush hours	• sends message "everyone welcome" but if you drive you pay—choose alternatives if possible	• done at many agencies outside UBC • compromise
Con's	• violates OCP commitment to increase not decrease rates to reduce auto trips to UBC	• works against "connecting" with neighbor communities, most of whom drive to UBC	• administrative costs to reimburse visitors who take the bus • parking prices raised to subsidize visitors, by ~3%
Costs	• $1 million/year loss in revenue would increase overall parking rates 15% to recover	•	• $25,000 in tickets (could be covered by 25% increase to meter rates)
Implementation Issues	• parking price increase • enforcement	•	• transit ticket distribution • ticket accounting • ticket issuance/vetting

Conclusion/Rationale:

Reimbursable: Implementation costs are low relative to community connection enhancement value, and transit promotion.

J. Parking

6. UBC Services - SHORT TERM

UBC service vehicles and staff traveling on campus need to park for deliveries or short trips. How can these vehicles be identified and accommodated, without permitting abuse by commuters?

	Status Quo	Service Charge	Line Item
Description	Free parking	Each time a vehicle parks, charge goes to building account	Show each parking stall as a charge against building
Pro's	• Keeps work and administration simple	• Induces reduction of unnecessary vehicle use	• Raises awareness • Promotes TREK program goals • Revenue could be used for TREK program to reduce TREK card costs and to fund shuttle on campus
Con's	• No incentive to reduce vehicle use	• How is parking rate set — equity issue • Some service calls must use vehicles — unfair	• No incentive to reduce vehicle use by service agency (could be addressed by splitting parking costs between client/server) • Administrative costs increase
Costs	•	• Administration and paper work	• Left/right hand transfer • Administration
Implementation Issues	•	• Record keeping on WO • Setting appropriate rates	• Record keeping on WO • Setting appropriate rates

Conclusion/Rationale:

Line item — Initial implementation will be an issue (i.e. what rate?), but then as a line item simpler to administer. Promotes lower TREK Card costs.

J. Parking

7. On-Street - SHORT TERM

Currently, parking is provided on many streets on campus, including parts of West Mall, East Mall, Wesbrook Mall and Northwest Marine Drive. In some locations, this parking is metered, but in many locations, the parking is free. On-street parking also poses a concern for cyclists, who can be injured by a suddenly-opened door or a motorist who pulls out from the curb without looking.

	Status Quo	Daytime	Ban
Description	MoTH on 16th, Marine UBC on Wesbrook	Ban 7 a.m. to 7 p.m.	No on-street parking
Pro's	• Those who can't afford to pay for parking can still park and walk/bike.	• Addresses most of commuter cycling times/GVRD Parks safety concerns.	• Consistent with/supported by OCP. • Maximum safety.
Con's	• Cyclist safety not addressed • Not reducing SOV use through adjacent neighborhoods.	• Weekends, evenings in the summer missed • Daytime park users lose • UBC car parkers lose • UBC Housing loses (maybe not)	• MoTH doesn't agree • GVRD Parks doesn't agree • UBC drivers lose
Costs	• 0 to UBC • Accident costs risk	• UBC parking demand may increase, net gain in revenue • signage • enforcement	• UBC parking demand may increase, net gain in revenue • signage • enforcement
Implementation Issues	•	•	• Political • Consultation

Conclusion/Rationale:

Daytime: Not ideal for everyone, but meets most needs and would be a working compromise.

J. Parking

8. Technology - SHORT TERM

New technologies are available for collecting parking charges, monitoring compliance with parking regulations, and assigning and collecting parking fines. Some of these technologies may offer substantial cost savings or revenue increases at UBC.

	Status Quo	Smart Card	Credit Card
Description	Paper, magnetic swipes	Smart Cards, give credits/points for days not parked, could be linked to Library Card, meals, transit, other on-campus services	Plus purchase power
Pro's	• Made at UBC • Photo ID can be used for transit and to minimize abuse • Monthly expiry makes it easier to control	• Cards last longer • BC Transit is moving to this; will allow incremental (actual cost) billing for TREK program. • Remote renewals/control	• Combined multi-purpose • Can link to other services
Con's	• More cost to administer due to manual interaction	• Higher initial cost • Big Brother perception • Lost cards cost to replace	• Relatively new, untested • Administration • Accounting • Lost/stolen card liability issues
Costs	• $3/card/year	• $7/card/2 years plus capital cost for support hardware	• $?
Implementation Issues	• 0	• Lost card verification • Initial start-up costs	• Lost/stolen cards

Conclusion/Rationale:

Smart card — technology is proven, and after initial start-up costs/issues, greatly simplifies administration and enforcement costs, reducing TREK program costs. Also allows better verification of actual use/costs for cost sharing agreements.

J. Parking

9. Enforcement - SHORT TERM

Currently, the University Act does not grant UBC the same powers to enforce parking regulations, collect parking fines and tow illegally parked vehicles as municipalities have. One of the only effective means UBC has of collecting parking fines is to withhold students' transcripts.

	Less	Status Quo	More
Description	Reduce enforcement efforts	Computerized enforcement Towing of multiple violators	Seek more authority to enforce with off-campus fine collection
Pro's	• lower costs • honor system • good PR value	• reasonable compliance rates	• higher fine collection • increased compliance
Con's	• minimum fine revenues • illegal vehicles may pose safety hazard if in emergency access areas	• efficiency could be improved	•
Costs	• Enforcement staff • fine revenues • safety concerns	•	• more staff, administration may be offset by revenue
Implementation Issues	• patrol scheduling • service reduction priorities	•	• Legal authority legislation

Conclusion/Rationale:

More - Pursue over longer term, in reciprocal/collaboration with other GVRD local areas to promote regional TDM and improved UBC trip reduction. Enforcement is essential to parking management, a cornerstone to trip reduction.

J. Parking

10. Coordination - SHORT TERM

Parking on campus is currently managed by several different departments within UBC. In order to support transportation demand management efforts, parking management should be coordinated. Who should be involved, and how can parking best be coordinated?

	Status Quo	Integrate	Mutual Sign-Offs
Description	P&T, Housing, Transportation Planning separate	Form a TAC Parking subcommittee, review/consult annually	Prior sign-off required on business plans
Pro's	• least cost to administer • allows closer focus on each market segment	• better coordination • promotes OCP goals to the fullest • everyone takes ownership	• Recognizes and maintains separate, but better coordinated administrative focuses
Con's	• lack of coordination between UBC departments erodes OCP goals	• increased administrative resources but these may be reduced by synergies of coordination/shared knowledge	• no ownership, accountability low, therefore no motivation to closely review to ensure OCP supportive
Costs	• lowest in short term	• high initially, lower in long term	• moderate
Implementation Issues	•	• dispute resolution • subcommittee structure • departmental barriers	• mutual sign offs how?

Conclusion/Rationale:

Move to more fully integrate via a subcommittee of the UBC Transportation Advisory Committee. Would need to invite UBC Housing into TAC. Seems to be great potential for synergies.

J. Parking

11. Supply - LONG TERM

There are currently approximately 10,700 parking stalls on campus, plus several hundred on-street parking spaces, and parking provided for residents. The current 5 Year UBC Parking Business Plan calls for the elimination of another 600 on-campus parking stalls as development occurs on surface lots, by the year 2002. This supports the UBC trip reduction strategy, but literature to date suggests that further reductions (i.e. versus parking price increases) may be a more equitable, effective tool to meet the 20% trip reduction target.

	Reduce	Status Quo
Description	9,000 stalls based on latest research	10,700 stalls, reduced to 10,100 as per current 5-year plan
Pro's	• promotes OCP goals • reduced auto use • potential to redevelop existing parking lots to keep compact campus • more effective/equitable than increasing prices	• no increase in illegal parking
Con's	• increased illegal parking in surrounding neighborhoods, unless increased enforcement	• less incentive to reduce auto use • no reduction in maintenance costs
Costs	• Reduced	• same
Implementation Issues	• implement gradually over the long term • increased enforcement needed	•

Conclusion/Rationale:

Reduce - Maintain the OCP strategy to reduce parking supply and auto use. Increases the attractive of car/van pooling preferred parking.

J. Parking

12. Pricing - SHORT TERM

Price is a key factor in the demand for parking as price increases, demand drops. Typically, a 1% increase in price results in a 0.3% drop in demand, although this can be highly variable depending on location, users and time of day. How should parking on campus be priced so as to be sensitive to auto drivers, support travel demand management efforts, and ensure sufficient revenues to pay for the costs of parking facilities, operation and maintenance?

	Status Quo	TDM: Match Transit
Description	Current prices, with annual increases as per current plans to cover expenses	B-Lot priced equivalent to one-zone round-trip bus fare Parkades, meters match Downtown Vancouver
Pro's	• no potential backlash from parkers	• strong incentive to switch from SOV to other modes • consistent with OCP objectives • increased parking revenues • more predictable
Con's	• B-Lot less than one-zone round trip transit fare • not necessarily coordinated with TREK	• potential backlash from parkers
Costs	• lowest	•
Implementation Issues	•	• how to price each facility so as to balance demand

Conclusion/Rationale:

Match 1-Zone transit fare increases - In the long term, promotes price predictability, improve coordination with and credibility to TREK program.

J. Parking

13. Bike Rack Locations - SHORT & LONG TERM

Many requests have been received for more bike racks located closer to building entrances. More prevalent bike racks encourages bike use, and promotes personal and bicycle security. But there are aesthetic considerations. Which take priority?

	Status Quo	Prominent	Priority
Description	Aesthetics & budget take priority	Case by case review Provision is mandatory	At main entrance of every building, and in B-lot, bus loop
Pro's	• minimum visual clutter • minimum cost	• ensures parking provided where needed • avoids visual clutter • minimizes bikes locked in out of sight locations	• maximum opportunity • minimum walking distance • most visible bike locations
Con's	• does not meet concern over lack of conveniently located bike parking	• parking may not be always convenient unless requested (BAC?)	• possible visual clutter unless well located, designed
Costs	• low	•	• high
Implementation Issues	•	• minimum requirements needed	• design guidelines/location warrants needed

Conclusion/Rationale:

Prominent - This strikes the best balance between undersupply and saturation. Over the long term, bicycle parking/racks will be provided where needed on campus while still being aesthetically sensitive.

J. Parking

14. New Buildings - LONG TERM

As UBC resolves to promote non-SOV travel modes, the bicycle will play a larger and larger part. End of trip facilities, including secure, sheltered parking, and change rooms, lockers and showers are fundamental to that role and becoming prevalent as regional standards. Should every new building be required to provide bicycle parking? Or should each case be reviewed? Perhaps there could be several major satellite bike parking/change room areas in designated buildings, rather than small numbers dispersed in each building.

	Each Building	Case Specific	Cash in Lieu
Description	Secure bike parking, lockers Shower, change room	Case by case review, depends on available space, funds. Cash in lieu if not on site. Provision of one or the other is mandatory	A $7,500 cash payment to the TREK Program in Lieu of each bike parking space required (this represents roughly half the cost of providing each under ground vehicular parking stall)
Pro's	• easy to estimate • lowest administrative • ensures good bicycle facilities	• promotes flexibility, responds to needs • optimizes demand	• maximum flexibility and control by TREK Program • provide direct TREK input to each building
Con's	• questionable utilization • highest cost per building, including maintenance	• temptation to delete in tight budget cases • administrative burden? • increased access hurdle	• temptation to use bike parking funds for other TREK program needs • long walking distances to/from bike parking
Costs	• data needed	• administrative reviews	• accounting
Implementation Issues	• who gets to use, this building only or outsiders?	• need warrants for when and when not to include • need minimum bike parking warrant per building	• must cash in lieu all go to bike parking or not?

Conclusion/Rationale:

Go with case specific but monitor to ensure progressive increase in bike facilities across campus. Also promotes growth of capital reserve for bike facilities and allows larger bike facilities in deficient areas at minimum extra cost.

K. Supporting Transportation Demand Management (TDM) Through Land Use - A LONG TERM ISSUE

When roads get congested, the reaction in the past has been to build more roads - an unaffordable, unsustainable option. Transportation Demand Management strives toward more sustainable policies for reducing trips made, including jobs/schools closer to home, restriction of parking supply, transit friendly roads, telecommuting, etc.. The TDM philosophy is well developed, but how is TDM implemented in a built environment (i.e. a retrofit situation)?

Overall Data:

- using TDM strategies instead of simply building more roads in the face of anticipated traffic growth, the GVRD hopes to save $4 billion in transportation expenditures over the next 25 years.
- The goal of TDM strategies is to influence people to shift to more-efficient modes of transportation and to travel during off-peak hours.
- … the most successful policies integrate supply and demand strategies to create a transportation network that promotes efficient, low-polluting choices." (Gordon 1991)

Further data needed
Maps: Future academic building sites
Future local areas/zoning

K. Supporting TDM Through Land Use

1. Academic Precinct - LONG TERM

Within the academic precinct the space is not available to provide major transportation facilities as part of new buildings. In fact, the building site may be tight for the intended purpose before access considerations are deliberated - drop off zones, parking, pedestrian areas, bike parking, service vehicles. Yet these access needs cannot be ignored if the building is to function successfully - goods, people and services create access demands that must be addressed.

	By Building	By Local Area/Precinct
Description	Access services at each building	Coordinated Area Access Management Plans
Pro's	• could be done as each new building is planned, or as existing buildings need	• promotes Traffic Calming • better coordination
Con's	• less coordination • repetitive for buildings in same area	•
Costs	• highest	• lowest
Implementation Issues	• Need to tie in each building with overall OCP	• Need area access management plans for bikes, service vehicles, traffic calming

Conclusion/Rationale:

Create Area Access Management/Traffic Calming plans throughout the academic precinct

K. Supporting TDM Through Land Use

2. OCP Local Areas - LONG TERM

In the course of developing land use plans for each OCP Local Area, transportation issues must be considered. These can be addressed on a site-by-site basis as development occurs, or can be addressed at the planning stage through an overall transportation plan for each Local Area. Which approach is best, and what transportation issues should be addressed?

	Overall	Local Area Plans	Individual Sites
Description	Traffic Impact Study (TIS) of Comprehensive Community Plan only	TIS of Individual Area Plans	TIS of Individual Buildings
Pro's	• could be done by one consultant • better overall coordination • minimal costs	• works on a coordinated review of the specific area • tailors to area land use mix and maximizes effectiveness of TDM opportunities	• permits detailed review of needs for each site, tailored to the market niche
Con's	• details may be missed • ignores fact that development will occur over 25 years, TDM needs may change	• could create excessive duplication given overall OCP objectives	• could create excessive paperwork, duplication of effort if for every building
Costs	• lowest	•	• Highest
Implementation Issues	•	•	• need warrants for whether every building or if only those above a certain size require a TIS

Conclusion/Rationale:

Hire TDM consultant to prepare comprehensive TDM plan for the Comprehensive Community Plan. Update it as each Local Area develops, or every 5 years (i.e. with the OCP), as the need arises.

K. Supporting TDM Through Land Use

3. Policies - LONG TERM

Development policies and bylaws can support transportation demand management efforts by discouraging single-occupant vehicle travel, and supporting other modes of travel. Such policies could include maximum allowable parking ratio per dwelling unit/employee space, transit friendly road layout, mixed land uses/complete communities promoting work near home, strong ped/bike links between home/service centres. Unfortunately, many home buyers in the todays market find it difficult to loose their grip on their vehicle and to a certain extent "drive" the real estate market - to put it bluntly, UBC will not realize its Endowment Fund goals if it cannot market a viable product. As UBC works toward a Comprehensive Community Plan that both meets Regional and OCP objectives but at the same time caters to the real estate market, how strictly should these TDM principles be adopted within UBC's various land use plans?

	Firm	Flexible
Description	Policies as Firm "Bylaws" - once set, no variance mechanism other than perhaps a 'Board of Variance'	Policies as "Guides" to Direct staff & developers - vary within some prescribed range, with public consultation requirement
Pro's	• cut and dried • could set penalties • clear in resident and developers minds • similar to municipal model	• allows UBC to be market responsive, but within OCP objectives/public consultation
Con's	• if UBC CCP misses the market, not viable	• accountability • difficult to enforce
Costs	• initially high, but once administrative means in place, could operate similar to a normal Board of Variance	• could be lowest if staff stick to guidelines; otherwise high for public meetings
Implementation Issues	• Board of Variance comprised of who?	• accountability, what constitutes need for public consultation - need policy

Conclusion/Rationale:

Go with municipal model, firm interpretation of land use policies, with Board of Variance to oversee any variances.

L. Getting Around UBC - A SHORT TERM ISSUE

To our credit, UBC is predominantly a pedestrian campus - but it's getting to be a longer and longer walk. The 10 minute interval between classes is coming under pressure. Accessibility for persons with handicaps is also being impacted. Classes off campus are becoming more frequent - intra-hospital shuttles. Ways to address this issues being suggested/considered include: BC Transit, Jack Bell vans, public bikes.

Further data needed:

- Current demand
- Hospital shuttle volumes
- Persons with handicap needs

L. Getting Around UBC

1. Evenings - SHORT TERM

More classes are being offered in the evening, with more students walking in the dark. Despite efforts to increase lighting levels and provide safe walk programs, personal security has continued as an issue. What more should be done - security shuttles, vans, status quo?

	More Security Shuttles	Pool Vehicles	Status Quo
Description	Add other security shuttles	augment security shuttle with pool vans as available	Stick with single security bus
Pro's	• Proper shuttle bus equipment (could it double as daytime use?)	• could use Plant Ops pool vehicles that are not used at night (i.e. double duty)	• stick with existing as capacity remains
Con's	• major capital investment • lack of space to park in daytime	• accelerated wear/tear • tampering with Plant Ops tools/equipment in the pool vehicles/vandalism	• Rides have gone from several hundred to over ten thousand - demand will soon exceed capacity
Costs	• Highest	•	• lowest
Implementation Issues	•	• fleet management • driver • insurance	•

Conclusion/Rationale:

Stick with status quo, but be cognizant of the fact that there are available pool vehicles in evenings. Rather than purchase new security shuttles when capacity demands, plan to use Plant Ops (or other available) pool vans/vehicles.

L. Getting Around UBC

2. Daytime - SHORT TERM

In the daytime, the issue on campus is lack of time to get between classes at opposite ends of the campus. The Campus Master Plan, 1992 and Official Community Plan, 1997 both talk about improved access via shuttles and transit, but at the same time wanting a strongly pedestrian core - can we have both?

	BC Transit	Pool Vehicles	Public Bikes
Description	BC Transit on east/west malls with fixed schedules	Vans/Security Shuttle on fixed routes/schedules	Offered throughout campus
Pro's	• integrates with BC Transit • no new UBC fleet vehicles	• smaller less intrusive vehicles • more accessible veh's • needed for staff with tools, supply transfer	• clean air, sustainable! • lowest cost • self maintained • could use Cargo bikes to transfer supplies, tools
Con's	• was done previously but removed - high costs • not supported by BC Transit	• still air pollution • who drives, insures • maintenance, management	• who maintains • high administrative needs • locking mechanism • vandalism, theft • most programs have failed
Costs	• highest	•	• lowest
Implementation Issues	• routes, frequency	• routes, frequency, drivers	• corporate champions • volunteers • on-campus repair shop

Conclusion/Rationale:

Go with Public Bikes as volunteers, corporate champions come forward. For service staff, acquire Cargo bikes. Adopt the Denmark Copenhagen model to charge a nominal deposit and have users take "ownership".

L. Getting Around UBC

3. Hospitals - SHORT TERM

Medical students and faculty are now shuttling via Jack Bell pool vans between the teaching hospitals. The pool van costs amount to well over $1,000 per month and in three years, the vans have put on over 160,000 km's. Normally, the pool vans are not expected to reach this mileage until at least five years of service - this was not the original intent of the Jack Bell van pools, but is functioning. Should it continue as a separate entity or can the TREK Program somehow integrate it?

	Status Quo	Partial Integration	Integrate with TREK
Description	Keep existing pool vans going Fund directly from Faculty of Medicine	Provide partial funding from TREK in return for use by other UBC students, staff, & faculty	Coordinate through TREK Fund as per other TREK program van pools
Pro's	• User pay	• win-win for medical student and TREK • stays with Jack Bell	• becomes a UBC pool vehicle
Con's	• Does not address high costs by medical faculty	• question of benefit for TREK investment	• Significant costs
Costs	• Lowest	•	• Highest
Implementation Issues	•	• Need policy on return to TREK for investment • who gets to use?	• Need policy on who / how to use • Maintenance of vehicles

Conclusion/Rationale:

Keep with status quo in interim. As TREK Program gets up and running, work to Partial Integration model via annual contribution as TREK funding/program costs stabilize and are available.

L. Getting Around UBC

4. Intersections - SHORT TERM

It seems every intersection at UBC is controlled by stop signs. The main function of stop signs is to assign right of way at uncontrolled intersections to avoid collisions/improve safety. In many of these locations, traffic volumes are so low that most people disregard the stop signs. In cases where disregard for stop signs is prevalent, perhaps other treatments are necessary.

	Status Quo	Yield Signs	Roundabouts
Description	Stop signs at every intersections	Where warranted, change stop to yield	From Great Britain, a raised island in the middle of the intersection prevents collisions, yield at enter, slows traffic
Pro's	• clear cut right-of-way •	• Yield still assigns right of way but doesn't require a stop • less delays	• sustainable • adaptable to traffic demand • minimizes delays
Con's	• over-use leads to lack of compliance	• Need clear warrants on when/how to change over	• ped/bikes at risk if vehicles present • more expensive
Costs	• lowest	• $100 per sign	• highest
Implementation Issues	•	• Stop to Yield Replacement warrant/policy needed	• driver, user education

Conclusion/Rationale:

Go with Yield signs at warranted intersections using a standard policy.

L. Getting Around UBC

5. Signage - LONG TERM

Visitors and students alike have noted they cannot find classes in unfamiliar parts of the campus. Is this a phenomena solved by practice, common to all large campuses, or can we do better in answering the questions - Where are we? Where are we going?

	Status Quo	More Prominent	Conspicuous
Description	As needed, street names only Current standards	Larger signs, sign type	Add more information and directional signs, map boards at major campus entrances
Pro's	• lowest cost • minimizes sign clutter • aesthetics	• graying population • improved readability	• major improvement in readability, information
Con's	• does not address concerns	•	• sign clutter • highest cost • is it really needed?
Costs	• Lowest	•	• Highest
Implementation Issues	•	• change over signs as maintenance occurs	• Add new signs

Conclusion/Rationale:

Stick with status quo, but explore costs of larger sign fonts for future replacement as maintenance requires.

III. Next Steps

A. Communications Strategy

A 'made in UBC' Plan necessarily requires a comprehensive consultation process, involving all means possible to reach as many stakeholders as possible. The key consultation avenues being pursued at this time are noted below, with a more detailed work program noted in the following Table.

1. UBC OCP Transportation Advisory Committee (TAC)

UBC has created a TAC to provide direct input to the Transportation Plan creation. The Committee is comprised of UBC representatives (from AMS, GSS, Faculty, Staff, Parking, Planning, Transportation, Purchasing, Registrar, Public Affairs, Sustainability, Personal Security), outside Agency representatives (from UEL, City of Vancouver, Provincial Highways, GVRD, BC Transit, Vancouver School Board), and community association representatives (Point Grey, Dunbar, Southwest Marine Drive, Merchants). Formal TAC meetings are held every few months, while TAC subcommittees meet more often, as needed to provide input on specific matters.

2. Web Site (www.trek.ubc.ca)

The Trek Program will rely heavily on a newly developed web site, the Trek site, to make available information on current programs and non-SOV travel options, and to spur feedback on transportation matters. The site was set up in January 1998 and is maintained by the Transportation Planning Office, or Trek Office.

3. Monthly Contests

To encourage ongoing feedback to the Trek office, monthly 3 Zone Transit passes are being offered each month. For November, a student won it for suggestions on improving bicycle safety. For December, another student (who also happens to be a member of UBC staff) won the contest with the suggestion that the UBC U-Pass Program be called the Trek Program. Future prizes will also be offered as part of the Trek to UBC Day on March 4th and other program initiatives.

4. Public Forums

Public forums are being held at the Student Union Building hosted by the AMS, GSS and TAC over the coming months to allow for an exchange of ideas on the direction, options, priorities for the UBC Strategic Transportation Plan, and to receive feedback on Discussion Papers related to development of the Plan. The format will include presentations and a panel discussion with members of the TAC present.

5. Travel Survey

The first campus-wide comprehensive travel survey was undertaken in late January. Its purpose is to ascertain, for students, staff and faculty, how they travel, why they choose certain travel modes, and how they would like to see the Trek Program tailored to their needs. The long term goal is to perform these surveys annually towards reducing SOV travel mode share by 20%

6. Discussion Papers

Three discussion papers will be released. Beginning with a paper focusing on raising awareness of the issues and opportunities. **This second discussion paper** is intended to review options/priorities for addressing the issues raised by comments received. In early March, Discussion Paper #3 will present the first draft of a UBC Strategic Transportation Plan for public review and comment.

7. Go Green Coordinators (i.e. Trek Torchbearers)

No program or process is sustainable without the empowerment and passion of the its stakeholders. We need you! We are looking for at least one (pairs would be ideal) volunteer from each work, study or teaching site to carry the Trek Program 'torch'. We'll provide your training and facilitate what minor time commitments you make to the program with your supervisor. We don't expect time commitments to be significant on an ongoing basis other than for an initial 1-day training course and orientation. After that, you would serve as our eyes, ears, and mouths to 'get the word' out/in on our various Trek Program initiatives. Think About It!

B. Information Centre

For more information and/or to provide comments on this discussion paper, please feel welcome to contact Gord Lovegrove, the UBC Director of Transportation Planning, at the Trek Office via telephone (822-1304), e-mail (lovegrove@exchange.ubc.ca), web site (www.trek.ubc.ca), or fax (822-3250). All comments received will be transcribed and available (contributor's names will be held confidential) for future reference throughout the process. Please ensure you leave your name and a number/e-mail by which we can get in contact with you if clarification / action is needed.

C. Revised Work Program

Revised Work program: February 5th, 1998

Priorities	Major Tasks	Target Dates
November 1997 **Climatize**	• UBC Director of Transportation Planning arrives • Trip Reduction Monthly Suggestion Contest Begins • Annual Traffic Data Collection Program • TAC Meeting	• November 10th • Mid-November • November 27th
December 1997 **Organize**	• November contest winner announced • Research and design STP process • Initiate U-Pass discussions with BC Transit • Visit University of Washington, research U-Pass	• Andreas Siebert • December 17th • December 19th
January 1998 **Inquire Why's**	• December contest winner announced • Trek Program web site up and running • STP Discussion Paper #1: Issues & Opportunities • Public Forum at SUB on GVTA • TAC Meeting • Press releases, inserts in UBC Reports, Ubyssey • Travel Survey of Students, Staff, Faculty	• Freda Pagani • January 5th • January 5th • January 8th • January 22nd • January 22nd • January 22nd
February 1998 **Theorize**	• January Contest Winner announce • **STP Discussion Paper #2: Options & Priorities** • Public Forum #1 at SUB on UBC Transportation Plan • Go Green Volunteer Training • Press releases, inserts in UBC Reports, Ubyssey • Mid-Term Break	• TBA! • **February 5th ←** • February 5th • February 12th, 23rd • February 12th • February 16 - 20th
March 1998 **Focus Eyes**	• February Contest Winner announce • Questionnaires back on Discussion Paper #2 • TREK to UBC / Go Green Day (% participation by group) • STP Discussion Paper #3: Draft Plan for Public Review • Public Forum #2 on Transportation Plan	• TBA! • March 2nd • March 4th! • March 5th • March 5th
April to Sept 98 **Everybody Tries**	• Negotiate/prepare to implement Trek Program • Review Draft Plan with UBC administration • Request Board of Governor approval to raise parking rates to support Trek Program in 1998/99	• Ongoing • Spring • Spring
Fall 1998/1999 **Do or Die**	• 1998/99 Parking Rate increases take effect • Further student/staff/faculty consultation on Draft Plan • Implement Trek Program • Monitor / feedback / fine tuning • Adoption of UBC Strategic Transportation Plan	• September 1st • Fall 1998 • Ongoing • Ongoing • Fall 1998

IV. Questionnaire

To: TREK Program Centre
Fax #: 822-3250
Attn: **Gord Lovegrove**

Please check which option's you support:

A.	**Sustainability**		
1. Education	**Basic**	**Moderate**	**Partners**
2. Participation	**UBC**	**Go Green**	**Ad Hoc UBC**
3. Monitoring	**Bi-annual**	**Annual**	**Semi-Annual**
4. Coordination	**Informal**	**Formal**	**Steering C'tee**
5. Marketing	**Annual**	**Semi-Annual**	**Aggressive**

Comments:

B.	**Trek Card**			
1. Product Design	**One Card**	**More than One**	**No TREK Card**	
2. Guaranteed Ride Home	**Not Included**	**Staff/Faculty**	**Everyone**	
3. Price	**One Price**	**Responsive**	**Multiple Zone**	
4. Payment Method	**Annual**	**Monthly**	**Semester**	
5. Participation	**Mandatory**	**Automatic**	**Optional**	
6. Implementation Date	**Limited '98**	**Introduce in '98**	**Introduce in '99**	
7. Technology	**UBC Card**	**Magnetic**	**BC Transit**	**SMART**
8. Funding	**None**	**DCCs**	**Grants**	**Sponsors**

Comments:

C.	**Pedestrians**			
1.	Safety	**Educate**	**Intersections**	**Comprehensive**
2.	Personal Security	**Status Quo**	**Walking Shuttle**	**More Security**
3.	Comfort	**Covered Walks**	**Tree Canopies**	**Status Quo**
4.	Disabled Access	**Status Quo**		**HandiDART**
5.	Walking Distance Between Classes	**Precincts**	**½ mile**	**Status Quo**

Comments: _____

D.	**Cyclists**			
1.	Bicycle Routes	**Share the Road**	**Bike Lanes**	**Off-road Paths**
2.	Parking	**Racks**	**Central Lockers**	**Indoor Racks**
3.	Education and Enforcement	**Status Quo**	**Workshops**	**Can Bike**
4.	Coordination	**Status Quo**	**UBC Bike Club**	**UBC BAC**
5.	Public Bikes	**Free**	**Student Society**	**Copenhagen**

Comments: _____

E.	**Car/Vanpooling**			
1.	Ridematching	**Status Quo**	**Flexible Hours**	**On-Campus**
2.	Marketing	**Status Quo**	**Event Oriented**	**Promotion**

Comments: _____

F.	**Transit**			
1.	Transit Capacity	**Adjust Buses**	**Adjust Schedule**	**Add More Buses**
2.	Service Reduction Periods	**Status Quo**		**More UBC Input**
3.	Transit Terminals	**Status Quo**	**Redevelop**	**Relocate**
4.	Shuttles	**Status Quo**	**Use Existing**	**More**
5.	Public Information	**Status Quo**		**Aggressively Promote**
6.	Coordination	**Status Quo**		**UBC Transit Committee**
7.	LRT	**Support LRT**	**Partner LRT**	**Status Quo**

Comments: _____

G.	**Telecommuting**		
1.	Logistics	**Status Quo**	**Promote**
2.	Distance Education	**Status Quo**	**Promote**

Comments: _____

H.	**Trucks**			
1.	Truck Routes	**Re-distribute**		**Status Quo**
2.	Construction Traffic Management	**Contractual**	**Scheduling**	**Status Quo**
3.	Goods Movement	**Prerequisite**	**Incentives**	**Status Quo**
4.	Coordination	**UBC Warehouse**	**Coordination**	**Status Quo**

Comments: _____

I.	**Roads**		
1. Control of Roads	**UBC Takes Over**		**MoTH Keeps Residual**
2. Road Hierarchy	**Strong Supporting Grid**		**Cul-de-sacs**
3. Traffic Calming	**Aggressive**	**Proactive**	**Status Quo**

Comments:

J.	**Parking**		
1. Carpools	**Free**	**Status Quo**	**Full Price**
2. Vanpools	**Free**	**Subsidized**	**Status Quo**
3. Motorcycles	**Free**	**Preferred**	**Full Fare**
4. Housing	**Status Quo**	**Coordinate**	**Integrate**
5. Visitor	**Free**	**Status Quo**	**Re-Imbursable**
6. UBC Services	**Status Quo**	**Service Charge**	**Line Item**
7. On-Street	**Status Quo**	**Daytime**	**Ban**
8. Technology	**Status Quo**	**Smart Card**	**Credit Card**
9. Enforcement	**Less**	**Status Quo**	**More**
10. Coordination	**Status Quo**	**Integrate**	**Mutual Sign-Offs**
11. Supply	**Reduce**		**Status Quo**
12. Pricing	**Status Quo**		**TDM: Match Transit**
13. Bike Rack Locations	**Status Quo**	**Prominent**	**Priority**
14. New Buildings	**Each Building**	**Case Specific**	**Cash-in-Lieu**

Comments:

K.	**Supporting TDM Through Land Use**		
1. Academic Precinct	**By Building**	**By Local Area/Precinct**	
2. OCP Local Areas	**Overall**	**LAPs**	**Individual Sites**
3. Policies	**Firm**	**Flexible**	

Comments: _____

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L.	**Getting Around UBC**		
1. Evenings	**More Shuttles**	**Pool Vehicles**	**Status Quo**
2. Daytime	**BC Transit**	**Pool Vehicles**	**Public Bikes**
3. Hospitals	**Status Quo**	**Part Integration**	**Integrate w/TREK**
4. Intersections	**Status Quo**	**Yield Signs**	**Roundabouts**
5. Signage	**Status Quo**	**More Prominent**	**Conspicuous**

Comments: _____

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- Do you want additional information on car/van pooling/ridesharing? Yes No
- Do you want a copy of previous discussion papers? Yes No
- Do you want additional information on _____ mode of travel? Yes No
- Do you want to sign up as a Go Green Volunteer? Yes No
- Your name/address/phone/fax/email for further contact/future mailings if you wish to be kept apprised of the process/newsletters.

Name: _____

Address: _____ **Phone:** _____

_____ **Fax:** _____

_____ **E-mail:** _____

Please fax this questionnaire to Gord Lovegrove at the TREK Program Centre.

V. References

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2. GVRD Strategic Planning Department, “Official Community Plan for Part of Electoral Area ‘A’: University of British Columbia and Part of Pacific Spirit Regional Park”, July 1997.
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27. Mathis Wackernagel & William Rees, Our Ecological Footprint: Reducing Human Impact on the Earth, Gabriola Island, 1996
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