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Cycling Canada

Long-Term Development
PARA-CYCLING

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Canada

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1 – Introduction

Cycling Canada recognizes Long-Term Athlete Development (LTAD) as a cornerstone for building cycling at all levels of competition and participation in Canada, for athletes of all abilities. LTAD provides a progressive pathway for athletes to optimize their development according to recognized stages and processes in human physical, mental, emotional, and cognitive maturation.

The CCC's Long-Term Athlete Development Guide presents a model for athlete development, and a list of recommendations for the cycling sport system to support athlete development. Several recommendations touch upon the need for more information, education and support for coaches, athletes and parents. This is especially needed in the area of Para-cycling, or cycling for athletes with a physical disability (AWAD)(now referred to as "physical impairment"). Canada has had many successes in Para-cycling, with athletes including Weldon, Molnar, Cournoyer, Longhi, Quévillon, and Larouche winning multiple Paralympic medals in international competition. Despite this, there is a very small number of Para-cyclists in Canada, and limited support, equipment, facilities and opportunities to help them progress. We can do more to build a program that welcomes athletes with physical impairment into the sport and provides them a progressive development and competition program based on LTAD principles.

This document is focused on the particular needs of athletes with a impairment in cycling. It is intended to be used alongside the CCC's *LTAD Guide*, as well as the LTAD publication *No Accidental Champions*. It is a guide for coaches, athletes, parents and sport leaders to welcoming Para-cyclists to the sport and to providing LTAD-based programs from entry to Active for Life stages. Our goal is not simply to help Canadian Para-cyclists to be the best in the world, but to ensure that every athlete with an impairment can enjoy participation in cycling for a lifetime.

LTAD is more than a model - it is a system and philosophy of sport development. LTAD is athlete-centered, coach-driven, and administration-supported. Athlete and participant development is at the core of the CCC's mission, so LTAD is key to everything we do, whatever our role or level within the cycling system. Our obligation is to help every Canadian cyclist fulfill their aspirations and be the best they can be. To do this, we must do two things: keep our sights set on the best in the world, and work together to meet and exceed that standard. That is the reason for this document.

2 – From Awareness to High Performance

Every athlete has limitations. The process of athlete development is one of discovering and overcoming those limitations, and this is no different for Para-cyclists. Using the Long-Term Athlete Development (LTAD) model as a guide, we can create optimal training, competition and recovery programs for all athletes which will help them overcome individual limitations and achieve their full potential.

Para-cycling is a life-time activity which provides opportunities for recreation as well as competition at the highest levels, and to a wide range of participants. Like all forms of cycling, it is social, outdoor, healthy, exciting and fun. A priority for Canadian Para-cycling is to increase awareness and actively introduce persons with a physical impairment to our sport.

LTAD is a model of life-long development in which the athlete passes through stages, from Active Start to Active for Life. In order to acquire a foundation of physical literacy or competence in basic movement and sport skills all individuals must pass through the Active Start, FUNdamentals and Learn to Train stages, from birth through adolescence. From there they progress as far as their will and potential carry them. Only a few reach the high performance Train to Compete and Train to Win stages. The CCC *LTAD Guide* outlines the stages of development for competitive cyclists, and those stages are equally valid and useful for Para-cyclists.

Not all cyclists pass through the Excellence stages; after learning the basics in the earliest stages, an individual can move to the Active for Life stage at any time. Active life-long participation is as important an objective for Canadians as is competitive success.

The LTAD publication *No Accidental Champions* presents two additional LTAD stages- *Awareness* and *First Contact*- to guide coaches in introducing athletes with a physical impairment to sport.

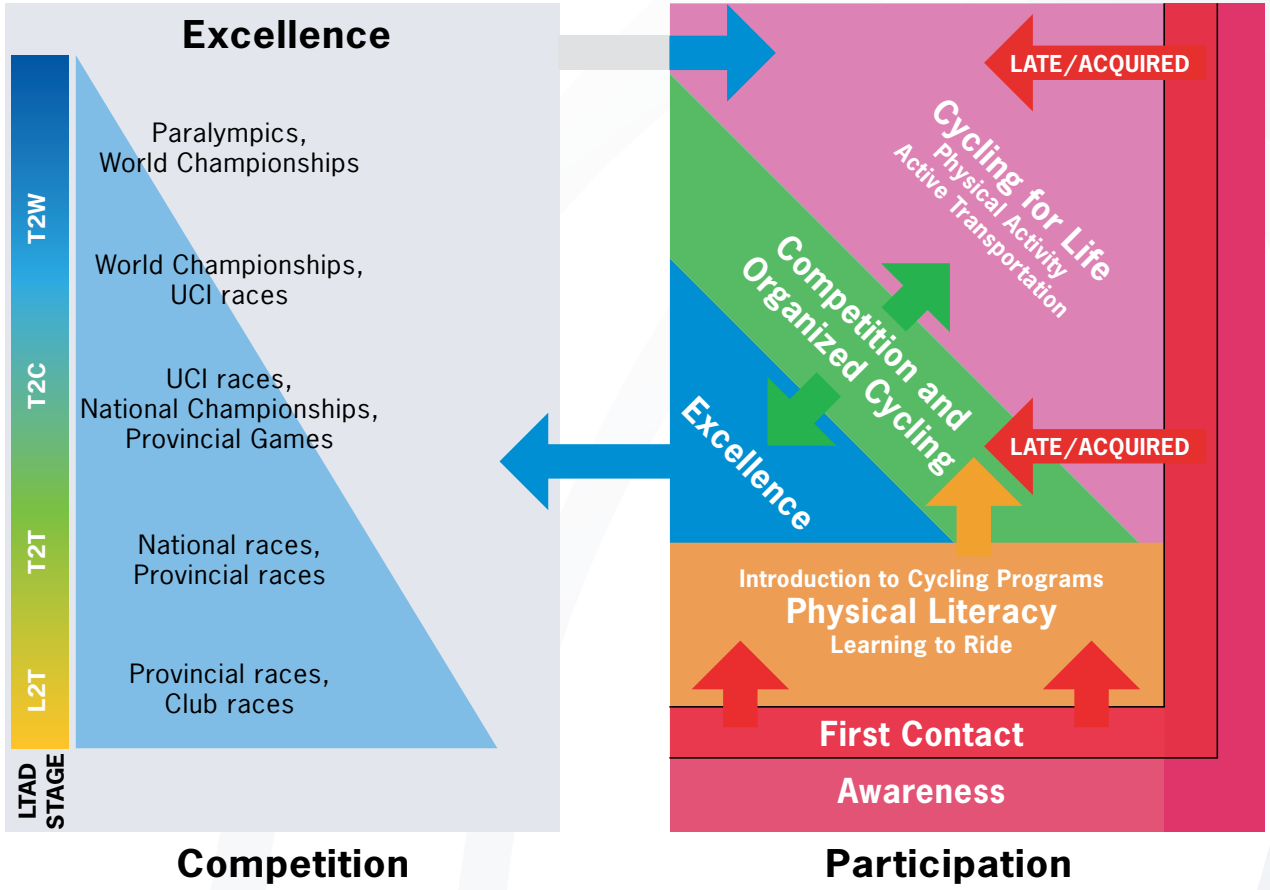


Diagram: Pathway through the Stages of LTAD. Enter at "Awareness".

Para-cycling Events

As of 2010, Para-cycling competition at the Paralympic Games includes track and road events for individuals and teams. The track events are individual sprint, team sprint, individual pursuit, and 500m time trial, Road events are massed-start road races, team relay and individual time trials. Events are for both men and women, with the cyclists grouped together according to their functional ability. Some events are open only to specific impairment groups.

In Canadian competition, some Para-cyclists are integrated into able-bodied cycling events, while others compete only with Para-cyclists, depending on the class of impairment and functional ability of the athlete.

Functional Ability and Classification

The major classes of impairment among Para-cyclists are Cerebral Palsy, Amputation, Visual Impairment/Blindness, Neurological Impairment/Spinal Cord Injury as well as other neurological disorders such as multiple sclerosis and polio. Each has a range of functional ability, from low-function to high-function. These disabilities may have been present from birth, called “Congenital Impairment” and some happen as a result of injury or illness later in life, called “Acquired Impairment”.

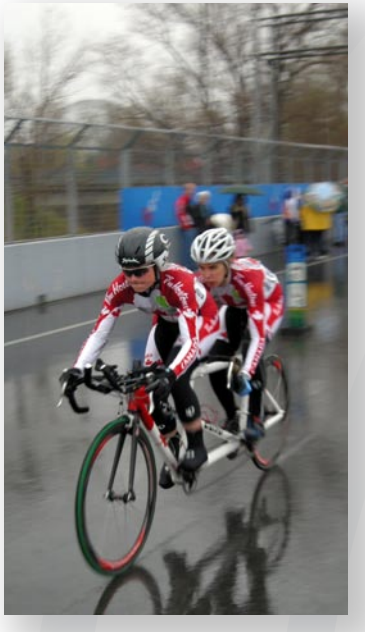
Para-cycling has four main divisions. The current Union Cycliste Internationale (UCI) Para-cycling classification system groups Para-cyclists based on type of cycle used and level of functional impairment. The 1st letter is the functional impairment group and the 2nd digit indicates severity of the impairment, with "1" being the most severely disabled:

- B1 - B3 : Blind and visually impaired athletes who use a Tandem;
- C1 - C5 : Cycle, including some Amputee and Cerebral Palsy and/or Traumatic Brain-Injured athletes, who use a regular bicycle;
- T1 - T2 : Tricycle, including some Cerebral Palsy and/or Traumatic Brain-Injured athletes;
- H1 - H4 : Handcycle, including some Neurologically-impaired, Spinal-cord Injured and Amputee athletes who use a handcycle rather than a regular bicycle.

Formal classification is done by trained classifiers using a set of functional assessment tests.

First Contact: Finding the Appropriate LTAD Stage

The "First Contact" stage has two goals: demonstrating to the athlete that he/she is welcome and has opportunities in Cycling, and assessing the athlete and guiding him/her to an appropriate starting point for training.



The initial determination of the entry point into cycling is a critical part of First Contact. The two key factors in determining the appropriate entry point for a new Para-cyclist are the nature and degree of the impairment, and the time in life when the individual acquired the impairment. An individual with high function who acquired the impairment after many years of previous athletic preparation may enter the LTAD pathway close to the same point as an able-bodied participant. An individual with lower function, limited or no athletic preparation, and without basic physical literacy, which might be the case with congenital impairment, will enter the LTAD pathway in an earlier stage. Chronological age is much less important in deciding where to place the athlete than is impairment type and degree of prior physical activity and training.

The following examples give an idea of how type and degree of impairment, previous sport experience and other life factors combine to determine a starting point:

1. Jean, aged 33 years, is a male with congenital CP who needs to use a walker or wheel chair for mobility. His speech is affected but his cognitive function is considered normal. Jean has not received a lot of physical motor development; what he did receive was under the care of a therapist and was aimed at improving mobility and flexibility, but with little cardiovascular or strength training. He likes to attend the therapeutic swim program for people with disabilities at the local pool. He is unable to ride a bike at this time, but wants to try. Jean would likely be classified as a T1 Tricycle Para-cyclist. The coach places Jean between the Fundamentals and Learn to Train stages of athlete development.

   Getting started:

   - Begin riding on a trainer to learn basic cycling movements in a safe environment.
   - Develop fitness and technique by riding the trainer for 20 minutes, three times a week for 3-4 weeks before learning to control a tricycle. Cycling shoes with cleats or toe-straps will help in keeping feet on pedals.
   - Contact the local CP Association and Provincial Cycling Association to seek support in finding a tricycle and other equipment to take the next step.

2. Susan is a 15 year old female High School student who has a congenital amputation of the right forearm. She uses a prosthetic and is very independent. She will be classified a C5 Para-cyclist. Susan has participated in a number of team sports but she is reluctant ride a bicycle because she feels unsafe. She has been fortunate to have experienced a positive/inclusive environment and is likely at the "Train to Train" stage of LTAD. With support from her parents, purchasing a bike and making adaptations for her prosthetic limb will be straightforward and after the initial fear subsides she should be able to join a club and obtain coaching.

   Getting started:

   - Set up position, control functions and prosthesis by riding on a trainer for a short period.
   - Begin riding with others in a safe environment (e.g. bike path) to build confidence.
   - Look into membership with the local Amputee Sport Association and Provincial Cycling Association to get access to resources and become part of organized cycling activities.

3. Simon is 40 years old. He is on disability allowance since a work-place accident that left him visually impaired 4 years ago. He played minor league hockey until he was 18 and was active in recreational sport at the time of his injury. It has been 25 years since he rode a bike for pleasure. He has enough vision to ride with a guide on quiet roads but he can't react to hazards on his own. For the time being he can ride with his 15 year old son who is quite athletic and interested in spending time with his father. Based on Simon's history and absence from any structured training for 22 years he would likely return to a "Learn to Train" stage of the LTAD. If he decides to compete he will be in the B2 or B3 category.

   Getting started:

   - Begin riding regularly on safe roads to build skill and fitness.
   - Contact the Provincial Blind Sports Association which may help with equipment, such as a tandem.
   - Join the Provincial Cycling Association to get access to resources, help find a tandem "pilot" and become part of organized cycling activities.

The most important factors in First Contact are support: the assistance of a coach, access to modified or impairment-specific cycling equipment, and having other athletes to train and compete with. Often the first steps are quite basic and with a little guidance the new Para-cyclist can begin enjoying the sport quickly.

Rates of Development and Enhanced Periods of Adaptation

In childhood through adolescence, individuals experience periods in which the brain and body are able to develop physical abilities more quickly, from flexibility (or suppleness) to speed to endurance (stamina) to strength. These are called Enhanced Periods of Adaptation. Linking appropriate sport training to these periods allows the athlete to develop optimally. "Missing" a period, on the other hand, requires the athlete to catch up later on. Estimating when these periods occur requires monitoring of growth and development. The onset of these periods and the growth spurt (also called "Peak Height Velocity" or PHV), can vary by 3-4 years in children.

The following diagram shows the enhanced periods of adaptation in relation to the rate of growth and Peak Height Velocity (PHV). Note that on average females reach PHV sooner than males.

There is limited research on how physical impairment affects overall physical development, or these periods of adaptation. It is known that in the intellectual impairment Down's Syndrome, the growth spurt may come earlier than in normal children. In Cerebral Palsy, lack of muscle tone or difficulty controlling movement (spasticiity) make it more difficult to be physically active in childhood, but it is not clear if development is delayed or the enhanced periods are changed. In other disabilities, such as blindness, there is no reason to believe physical development is affected. The best rule for the coach is to monitor the rate of growth and development to estimate where the enhanced periods or windows fall, and to suggest appropriate training and competition activities accordingly.

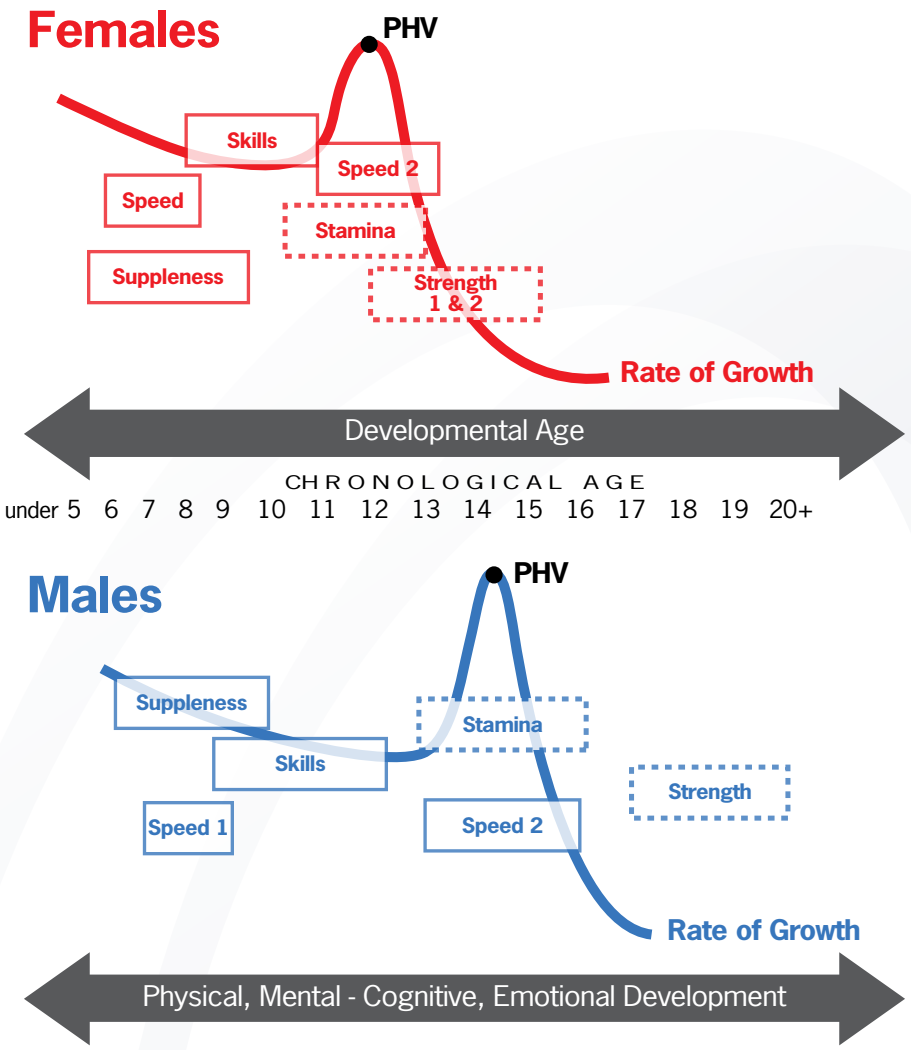
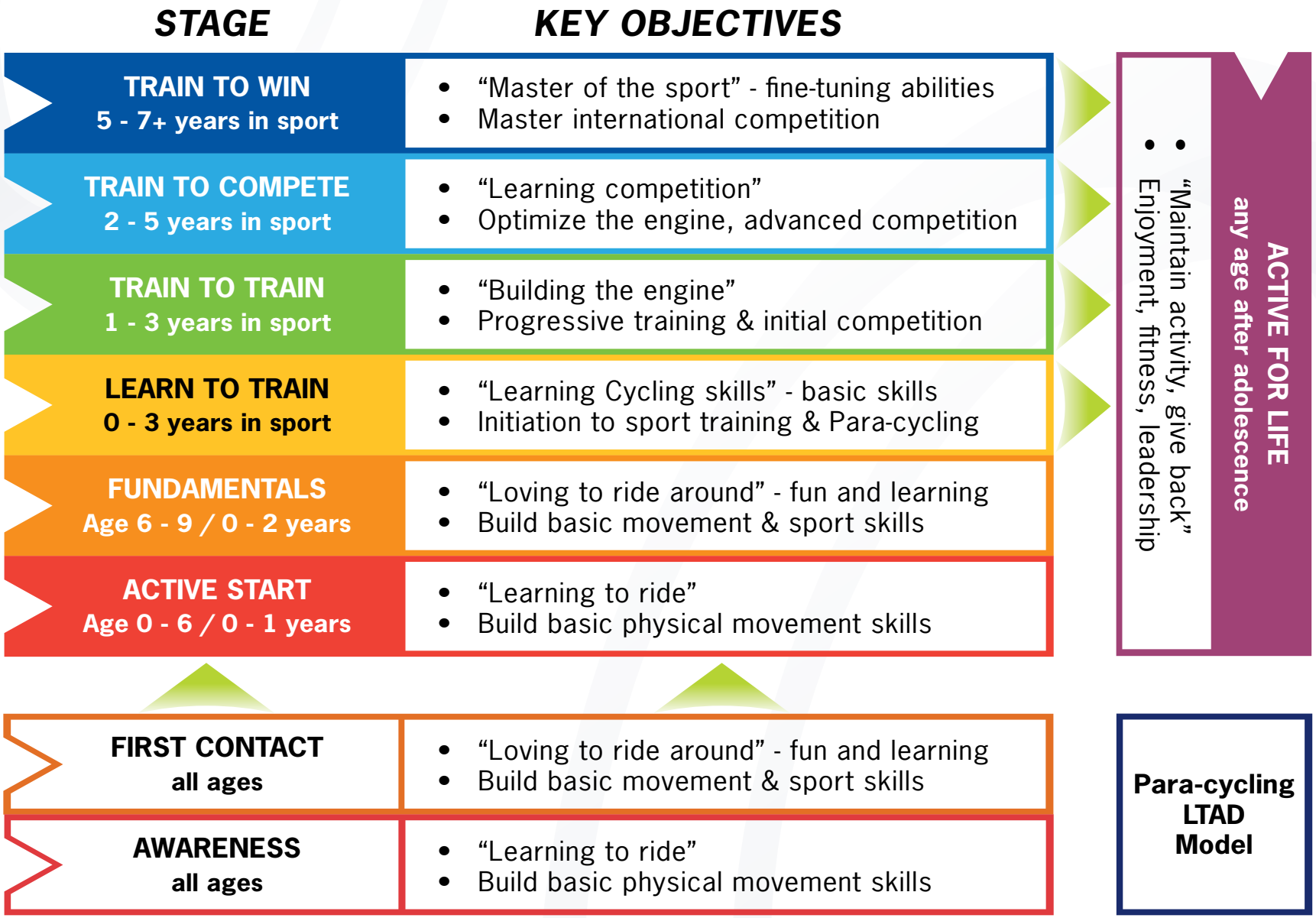


Diagram: Enhanced Periods of Adaptation in Relation to Rate of Growth (courtesy Canadian Sport for Life)

From First Contact to High Performance

With a little support, any interested individual can become a Para-cyclist. Reaching high performance, perhaps competing in International event like Paralympic Games, is much more difficult. Para-cyclists competing at World Championship and Paralympic level are as dedicated and highly trained as the best able-bodied cyclists. Unless the athlete has acquired a impairment while already a high-performance athlete, it usually takes from 5 to 7 or more years of intensive training and competition to reach the Train to Win stage in Para-cycling. To succeed, Para-cyclists need top coaches, an optimal competition program with opportunities to race against competitors of similar ability, and a solid infrastructure including classifiers, sport science support, and access to high-level equipment and facilities.

The table below shows some key objectives for Para-cyclists in each stage of LTAD. Note that "years in sport" includes all kinds of sport experience, not just cycling. In earlier stages, especially, individuals should participate in a wide range of physical activities to develop well-rounded basic movement and sport skills. Specialization should not occur until these skills are developed.


STAGE
KEY OBJECTIVES
TRAIN TO WIN
5 - 7+ years in sport
• "Master of the sport" - fine-tuning abilities
• Master international competition
TRAIN TO COMPETE
2 - 5 years in sport
• "Learning competition"
• Optimize the engine, advanced competition
TRAIN TO TRAIN
1 - 3 years in sport
• "Building the engine"
• Progressive training & initial competition
LEARN TO TRAIN
0 - 3 years in sport
• "Learning Cycling skills" - basic skills
• Initiation to sport training & Para-cycling
FUNDAMENTALS
Age 6 - 9 / 0 - 2 years
• "Loving to ride around" - fun and learning
• Build basic movement & sport skills
ACTIVE START
Age 0 - 6 / 0 - 1 years
• "Learning to ride"
• Build basic physical movement skills
FIRST CONTACT
all ages
• "Loving to ride around" - fun and learning
• Build basic movement & sport skills
AWARENESS
all ages
• "Learning to ride"
• Build basic physical movement skills
ACTIVE FOR LIFE
any age after adolescence
• "Maintain activity, give back"
• Enjoyment, fitness, leadership
Para-cycling
LTAD
Model

3 – Canada's Para-cycling System: Overview and Para-cycling Stage by Stage

LTAD STAGE & THEME	YEARS IN SPORT	DELIVERY PARTNERS	CYCLING DELIVERY	COMPETITION: PREPARATION	COMPETITION: ULTIMATE GOALS	PROGRAMS
Active for Life "Maintain Activity, Give Back"	Enter at any time after adolescence	• Local Disability organizations • Local Disability-sport organizations	• Cycling clubs & coaches	• If desired: club and Provincial racing	• If desired: club and Provincial racing	• Cycling club and local Disability-sport organization programs
Train to Win "Master of Competition"	5 – 7+ sport years	• UCI, IPC, IBSA, ISMWSF, CP-ISRA • CCC, CPC	• CCC – Nat Team selection & coaching • PSO – Prov Team selection • Cycling clubs	• International races • National Champs • Provincial Champs • Provincial races	• Paralympic Games • ParaPanAm Games • World Championships • International races (European Open)	• Sport Canada carding • Provincial carding • Canadian Sport Centers- sport science and sport medicine • National and Provincial Training Camps • Regional Cycling Centers • Sport schools
Train to Compete "Learning Competition"	2 – 5 sport years	• Provincial Disability-sport organizations	• PSO – selection & coaching • Cycling clubs	• Provincial races • Provincial Champs	• National Champs • Provincial Games	
Train to Train "Building the Engine"	1 – 3 sport years	• Provincial Disability-sport organizations	• PSO - selection • Cycling clubs & coaches	• Provincial & club races • Provincial Champs	• National races • Provincial Games	
Learn to Train "Learning Cycling Skills"	0 – 3 sport years	• Provincial Disability-sport organizations	• Cycling clubs & coaches	• Club & Provincial races	• Provincial Champs	• Adapted Learn to Race programs
FUNdamentals "Loving to Ride Around"	Ages 6 – 9* 0 – 2 sport years	• Family, schools • Local Disability organizations • Local Disability-sport organizations	• Cycling clubs & coaches – support delivery by schools, parents	• No competition in this stage • Participate in multiple sports; develop sport skills		• Adapted Learn to Ride programs
Active Start "Learning to Ride"	Ages 0 – 6* 0 – 1 sport years	• Family, schools • Local Disability organizations • Local Disability-sport organizations	• Cycling clubs & coaches – support delivery by schools, parents	• No competition in this stage • Participate in multiple physical activities; develop movement skills		• Adapted Learn to Ride programs
Athletes with sport experience prior to acquiring impairment may enter at advanced stages: Learn to Train, Train to Train, Train to Compete						
First Contact "Getting Started"	0 sport years	• Provincial and local disability-sport organizations	• PSOs - programs • Cycling clubs & coaches - contact	• Cooperate with schools, Disability Organizations (e.g. local CP, CNIB branches), and Disability Sport Organizations (e.g. local Wheelchair Sport, Blind Sport branches) to recruit Para-cyclists and support them with equipment, facilities. • Initial contact with Para-cycling coach: introduction to Para-cycling. • Offer "Try It" programs.		
Awareness "Finding an Opportunity"	0 sport years	• Family, friends, school • Rehabilitation & readaptation centers • Prov & local disability organizations	• PSOs - programs • Cycling clubs & coaches - contact	• Build awareness of Para-cycling in schools, with Disability Organizations (e.g. local CP, CNIB branches), with Disability Sport Organizations (e.g. local Wheelchair Sport, Blind Sport branches) and with health care professionals.		

Legend: UCI: Union Cycliste Internationale; IPC: International Peralympic Committee; IBSA: International Blind Sports Association; ISMWSF: International Stoke Mandeville Wheelchair Sports Federation; CP-ISRA: Cerebral Palsy International Sports and Recreation Association; CCC: Cycling Canada Cyclisme; CPC: Canadian Paralympic Committee; PSO: Provincial Cycling Organization

Para-cycling Stage by Stage

The following table shows key Para-cycling developmental factors for LTAD stages. To simplify the model, only the cycling-specific stages from Learn to Train to Train to Win and Active for Life are shown here. For more information on Awareness, First Contact, Active Start and FUNdamentals refer to the Canadian Sport for Life publication, *No Accidental Champions*.

Since the rate of development in some athletes with a impairment may vary significantly both physically and cognitively, Para-cycling stages are based on "sport years" which is the time the athlete spent developing in sport.

	LEARN TO TRAIN 0 – 3 years in sport	TRAIN TO TRAIN 1 – 3 years in sport	TRAIN TO COMPETE 2 – 5 years in sport	TRAIN TO WIN 5 - 7+ years in sport	ACTIVE FOR LIFE any age after adolescence
Defining the Stage	• "Developing cycling literacy" Participants build on a base of physical literacy formed in the Active Start and FUNdamentals stages. • Introduction to Para-cycling and a sport training program. • Emphasis on acquiring and developing cycling skills. • Participation in multiple sports including cycling.	• "Building the engine" • Enjoy and appreciate the sport of cycling • Begin a progressive Para-cycling training program. • Emphasis on developing and refining cycling skills. • Participation in multiple sports including cycling.	• "Optimizing the engine" • Learning and refining competition skills • Progressive, periodized, year-round Para-cycling training program. • Emphasis on refining cycling skills: physical, technical, tactical, mental. • Specializing in cycling but may still compete in another sport.	• "Maximizing the engine" • Refining and mastering competition skills • Progressive, periodized, year-round Para-cycling training program. Intensive, year-round. • Mastery of all cycling skills: physical, technical, tactical, mental. • Specialized in cycling and specialized in single discipline.	• "Maintain activity, give back" • Enjoy and appreciate the sport of cycling • Emphasis on maintaining fitness through year-round activity. • Participation in multiple sports including cycling. • Look for leadership opportunities e.g. coaching, officiating
Participant Profile	• Entering sport and Para-cycling. • Participant may be any age, but if age 9-12 windows of trainability are important. • Participant may not be interested in competition or has some concerns about racing. Focus on adaptation to sport, building on successful First Contact.	• Well-adapted and becoming more confident about sport. • Becoming serious about Para-cycling- "loving the sport". • Participant may be any age, but if age 13-15 windows of trainability are critical. • Participant wants to try competition, so a positive first race experience is important.	• Serious about Para-cycling and committed to excellence. • Actively searching for support: financial, coaching, equipment, competition opportunities • May be experiencing stress balancing job/school and family with sport participation	• Fully committed to excellence. Focus on highest level of competition: World Championships & major Games • Has built support network: financial, coaching, equipment, competition • Is mastering stress of maintaining peak performance while balancing job/school/family	• Well-adapted and confident about sport participation. • Enjoys cycling. • Participant may be any age after adolescence (basic physical literacy is developed). • Sport participation is important to physical and emotional well-being and is a part of social life.

	LEARN TO TRAIN 0 – 3 years in sport	TRAIN TO TRAIN 1 – 3 years in sport	TRAIN TO COMPETE 2 – 5 years in sport	TRAIN TO WIN 5 - 7+ years in sport	ACTIVE FOR LIFE any age after adolescence
Overall Objectives	• Learn basic cycling skills • Adapt to sport training • Develop good position on cycle and pedaling technique • Build general activity level and fitness through cycling and other sports	• Consolidate basic cycling skills • Work with a good coach to adapt to Para-cycling specific training routine • Enter regular competition • Build cycling fitness through cycling and other sports	• Refine advanced cycling skills • Work with a good coach to move toward high performance • Regular competition; introduce international competition • Build a support network to help improve performance and balance financial and life needs	• Master advanced cycling skills • Self-knowledge: has support of good coach but is self-reliant • Regular international competition • "Perform on demand" • Support network in place to help improve performance and balance financial and life needs • Role model for sport	• Maintain regular physical activity • May compete as desired • Find ways to give to sport as a coach, official or leader
Para-specific Objectives & Support	• If recently-acquired impairment, support adaptation to life with impairment. • Utilize expertise of appropriate disability-sport organizations • Use fun approach to learning new skills, building fitness • Activities need to be adapted to suit the individual by considering the range of movement, coordination, limb loss, paralysis, visual impairment. • Help athlete overcome over-protectiveness of parents, medical community, etc. Sport in inclusive environment aids overall development.	• Activities need to be adapted to suit the individual by considering the range of movement, coordination, limb loss, paralysis, visual impairment. • Utilize expertise of appropriate disability-sport organizations • Use fun approach to learning new skills, building fitness • Find other Para-cyclists for support and training • Emphasize communication between coach, parents, health professionals, etc.	• Access to high-level equipment and facilities • Financial support for training and competition • Careful management of budget • Work with competent coach and emphasize communication between coach and cycling organizations • Access to sport science and specialists (nutrition, physio, psychologist, etc) – building a support network	• Access to high-level equipment and facilities • Financial support for training and competition • Careful management of budget • Work with competent coach; emphasize multi-year planning and communication between coach and cycling organizations • Access to sport science and specialists (nutrition, physio, psychologist, etc) – strong support network in place	• Access to equipment and facilities • Access to coach if desired • Access to appropriate sport programs

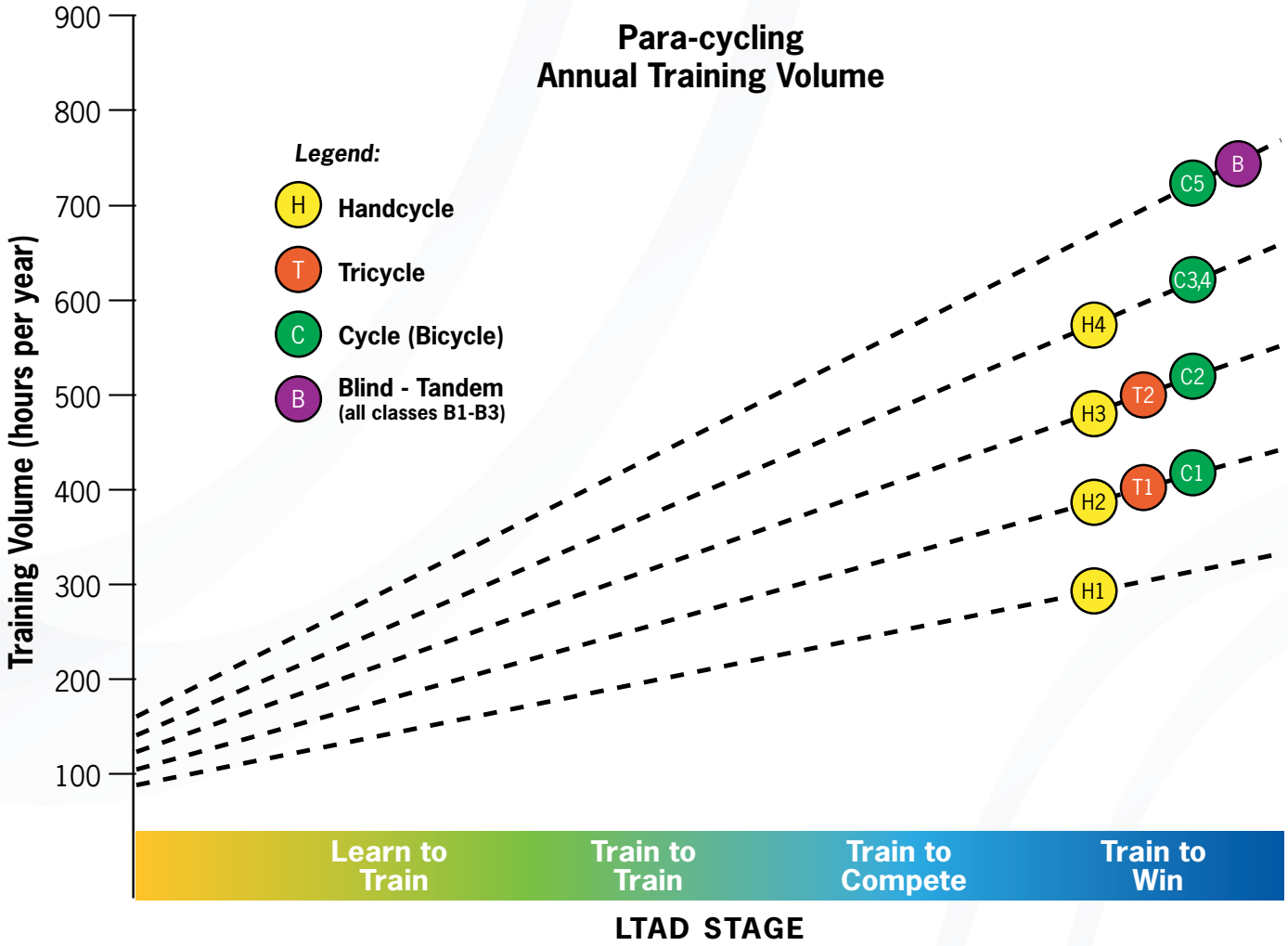
	LEARN TO TRAIN 0 – 3 years in sport	TRAIN TO TRAIN 1 – 3 years in sport	TRAIN TO COMPETE 2 – 5 years in sport	TRAIN TO WIN 5 - 7+ years in sport	ACTIVE FOR LIFE any age after adolescence
Physical Development	• Congenital age 9-12: be aware of and monitor maturation which may occur at different rate depending on nature of impairment. PHV, rate of limb growth, etc may be delayed. • Build fundamental sport skills and motor development • Speed, power and endurance through FUN and games • Strength: Build core strength and stability- use own body weight • Introduction to concept of warm up/cool down • Anaerobic power: incidental development only through fun and games • Aerobic power: incidental development through fun and games. Some specific development.	• If age 13-15, be aware of and monitor maturation which may occur at different rate or be delayed depending on impairment. • Congenital: PHV, rate of limb growth, etc may be delayed. • Speed, power and endurance: cycling-specific activities • Strength: Build core strength and stability- use own body weight and weights. • Refine warm up/cool down • Anaerobic power: development through games; introduce specific training techniques in competition phase • Aerobic power: Mix of development through fun and games, and specific development. Note window of trainability at puberty. If adult, progressive increase in aerobic training through the stage.	• Advanced sport specific drills • Speed, power: specific sprint training • Strength: Athlete specific core strength and stability, ankle and knee stability, free weights. • Sport specific strength in specific preparation phase • Warm up/cool down- integral, specific to training and competition • Anaerobic power: specific prep and competition phases, targeted development • Aerobic power: Specific training and complementary sports.	• Advanced sport specific drills • Speed, power: specific sprint training • Strength: Athlete specific core strength and stability, ankle and knee stability, free weights. • Sport specific strength in specific preparation phase • Warm up/cool down- integral, specific to training and competition • Anaerobic power: specific prep and competition phases, targeted development • Aerobic power: develop in preparation phase and maintain in competition phase.	• Speed, power and endurance through FUN and games • Strength: Build core strength and stability- use own body weight or weights as desired • Aerobic power: Mix of development through fun and games, and specific development. • Participation in multiple sports and activities
Technical Development	• Explore risks and limits in a secure environment • Develop good cycling position and pedaling technique • Develop basic cycling skills: turn, climb, descend, accelerate, brake, use of gears • Focus on motivating and FUN activities	• Consolidate basic cycling skills: turn, climb, descend, accelerate, brake, use of gears • Continue to develop skills in progressively challenging situations (e.g group riding, wet conditions, etc)	• Refine advanced skills • Experiment with techniques : group-riding, sprint lead-out, regulating pace and effort	• Mastery of technique • Innovating skills • Ability to minimize energy expenditure and maximize recovery in races	• Explore risks and limits in a secure environment • Develop and maintain good cycling position and pedaling technique, cycling skills • Focus on motivating and FUN activities

	LEARN TO TRAIN 0 – 3 years in sport	TRAIN TO TRAIN 1 – 3 years in sport	TRAIN TO COMPETE 2 – 5 years in sport	TRAIN TO WIN 5 - 7+ years in sport	ACTIVE FOR LIFE any age after adolescence
Tactical Development	• Learn basic concepts and rules of competition- mass, time trial • Develop basic tactics, ethics • Watch races for learning	• Advanced concepts and rules of competition • Develop race tactics: sense of pace, group tactics	• Refine competition tactics. Test different strategies. Team tactics, attack and counter-attack, sprint strategy. • Refine knowledge of rules • Consolidate ethical framework	• Mastery of competition tactics and rules • Innovating tactics • Refine ethical framework • Ability to control race situations and minimize energy expenditure in races	• Tactics appropriate to level of racing (if desired)
Mental Skill Development	• Motor learning integrated into practices • Focus on motivating and FUN activities • Emphasize effort, doing one's best	• Motor learning integrated into practices • Develop mental preparation; appropriate attitude to competition, being the best you can be, belief in the training process	• Decision making • Refine mental preparation • Social psychology and team dynamics • Manage distractions	• Focus on target results • Refine decision making • Advanced mental preparation • Manage distractions • Social psychology and team dynamics	• Mental skill development appropriate to level of racing (if desired)
Training Program	• Seasonal training program • Participate in multiple other sports and cycling disciplines to build athletic skills	• Seasonal or annual training program with single periodization • May participate in up to 2 other sports or disciplines	• Annual program with single periodization- 1 main competition with multiple sub peaks • May participate in up to 2 other sports but beginning to specialize	• Fully periodized program with multiple peaks • Multi-year (quadrennial) plan • Specialized but may participate in a complimentary other sport	• Daily physical activity • Training appropriate to level of competition desired, if any • Participation in multiple sport activities
Competition Framework	• Training and competition with others is useful for development in this stage. This may include club cycling programs, training groups, camps, etc. • Limited introduction to competition if desired and appropriate to athlete • Club, regional, provincial races leading to Provincial Championships and Games. • Competition may include all types recognized by UCI	• Provincial-level racing; introduce National-level near end of stage • May compete in multiple cycling disciplines as appropriate • Where appropriate, competition integrated with able-bodied athletes • Competition may include all types recognized by UCI	• Compete in club and provincial events with national camps, leading to Provincial Games and Championships and National Championships • Introduce international-level competition including North American international-sanction races. • Where appropriate, competition integrated with able-bodied cyclists	• Compete in provincial, national and international events with national training camps, leading to World Cup, World Championships and Major Games (e.g. Paralympic Games) • Regular international-level competition- National Team. • Where appropriate, competition integrated with able-bodied cyclists	• Competition if desired and appropriate to athlete

	LEARN TO TRAIN 0 – 3 years in sport	TRAIN TO TRAIN 1 – 3 years in sport	TRAIN TO COMPETE 2 – 5 years in sport	TRAIN TO WIN 5 - 7+ years in sport	ACTIVE FOR LIFE any age after adolescence
System Leaders	• Coaches • Cycling Clubs • Disability Sport Organizations • Parents	• Coaches • Cycling Clubs • PSOs	• Coaches • Cycling Clubs • PSOs • CCC: Development Team	• Coaches • CCC: National Team • Canadian Paralympic Committee	• Cycling Clubs • Disability Sport Organizations
Coaching	• Let's Ride! Community Cycling Initiation – trained, or • Coach working toward certification in Ready to Race! Introduction to Competition • Access support, training and expertise from Disability Sport Organizations.	• Coach working toward certification in Ready to Race! Introduction to Competition • Access support, training and expertise from Disability Sport Organizations.	• Coach working toward certification in Performance Competition Development or • Certified cycling coach supervised by Performance coach	• Coach working toward certification in Excellence Competition High Performance (Levels NCCP: Level 4/5), or • Certified cycling coach supervised by Excellence coach	• Coach if appropriate and desired • Community Cycling Ongoing – trained
Sport Services	• The athlete may apply for classification late in this stage.	• The athlete should apply for classification early in this stage.	• Athlete must be classified for competition by this point. • Building team of sport science and specialists (nutrition, physio, psychologist, mechanic, etc)	• Full access to sport science and specialists (nutrition, physio, psychologist, mechanic, etc) – strong support network in place	• None in this stage.
Testing & Talent ID	• None in this stage.	• Introduce performance measurement (by coach) • Initial entry in selection races • Consult CCC Selection Criteria for appropriate standards	• Introduce regular sport science support and physiological testing- quarterly • Pursuit of team selection at selection races and camps • Base training in part on meeting CCC Selection Criteria.	• Regular sport science support and physiological testing- bimonthly • Pursuit of team selection at selection races and camps • Meet CCC Selection Criteria.	• None in this stage.

Estimating Training Volume for Para-cycling

Annual training volume consists of the number of hours of training including cycling and non-cycling training. Determining the appropriate volume depends on many factors: current LTAD stage, previous years in sport and sport background, type of impairment, and severity of impairment. For example, athletes with less muscle mass (leg amputees, paraplegics using handcycles) usually do less volume than a cyclist using both legs. Athletes with more years in sport or experience in endurance sport may be able to do greater volume. The chart below is a guideline only. (*Note: Tandem pilots should refer to the CCC LTAD guide for able-bodied athletes.*)



4 – Building the Para-cycling System: Success Factors

Persons with a impairment make up about 10% of the Canadian population, yet many cycling organizations and coaches do not offer support or programs to Para-cycling. To help talented and dedicated Para-cyclists reach international podiums, or simply to offer them the chance to enjoy cycling, we need a strong Canadian Para-cycling system.

Our objectives are clear:

- With support of Disability Sport Organizations, Cycling Clubs and PSOs, build awareness of Para-cycling as a sport option to all physically disabled persons.
- All Cycling Clubs will offer basic support and direction to Para-cyclists, and specialized Para-cycling Clubs will exist in major population centers.
- All Coaches will have an understanding of Para-cycling through the Cycling National Coaching Certification Program.
- All PSOs will have at least basic programs and key contact persons for Para-cycling, and all Provincial Coaches will support Para-cycling athletes.
- The number of licensed Para-cycling competitors will be proportional to the population of disabled persons, with an estimated goal of 750 licensed racers (as of 2009).
- Canada's Para-cyclists will achieve international competitive success proportionally equal to or greater than our able-bodied cyclists.

Building a stronger Para-cycling program will require more energy, dedication, and partnership than for able-bodied cycling. Developing awareness and recruitment initiatives, providing specialized equipment, attracting more coaches, supporting additional athlete transportation costs, and providing an appropriate competition program are all necessary components of LTAD for Para-cycling. Currently, some critical needs in the development system for athletes with a impairment are:

- *People:* Trained coaches, officials, and classifiers, and "helpers" such as sighted cyclists to pilot tandems for blind athletes are needed at all levels.
- *Partnerships:* Cycling organizations can access expertise and support through partnership with disability and disability-sport organizations.
- *Transportation:* Since there are fewer athletes, individual Para-cyclists must travel farther to form appropriate-sized training groups and competitions, and to access specialized facilities and equipment. Extra support is needed.
- *Equipment:* Handcycles, tricycles, tandems, and prosthetics can be expensive and hard-to-find.
- *Competitions:* Provincial cycling associations need to integrate Para-cyclists into existing events or hold additional Para-specific races, as appropriate. In particular, including Para-cycling in road Time Trial (TT) events is simple and every TT should include Para distances and events. Coordination between cycling jurisdictions (PSOs, CCC) is needed to prevent schedule overlaps to ensure appropriate-sized fields.

Getting Started: The first steps to a stronger Canadian Para-cycling system are:

CCC: Provides resources, selection process, and expertise to all stakeholders.

PSO: Every PSO has a defined program to support Para-cycling.

COACHES: Every Coach aware of how to support Para-cyclists, and offers help if requested.

OFFICIALS: Every Official understands how to support Para-cycling in competitions.

ORGANIZERS: Every Organizer of TT events includes Para-cycling TT distances/classes.

ADMINISTRATORS: Every organization, from Club to CCC, includes Para in their plans.

We can and will be successful if we use the resources and organizations already available, and include Para-cycling in our plans right from the start. The following chart shows success factors for Canadian Para-cycling development.

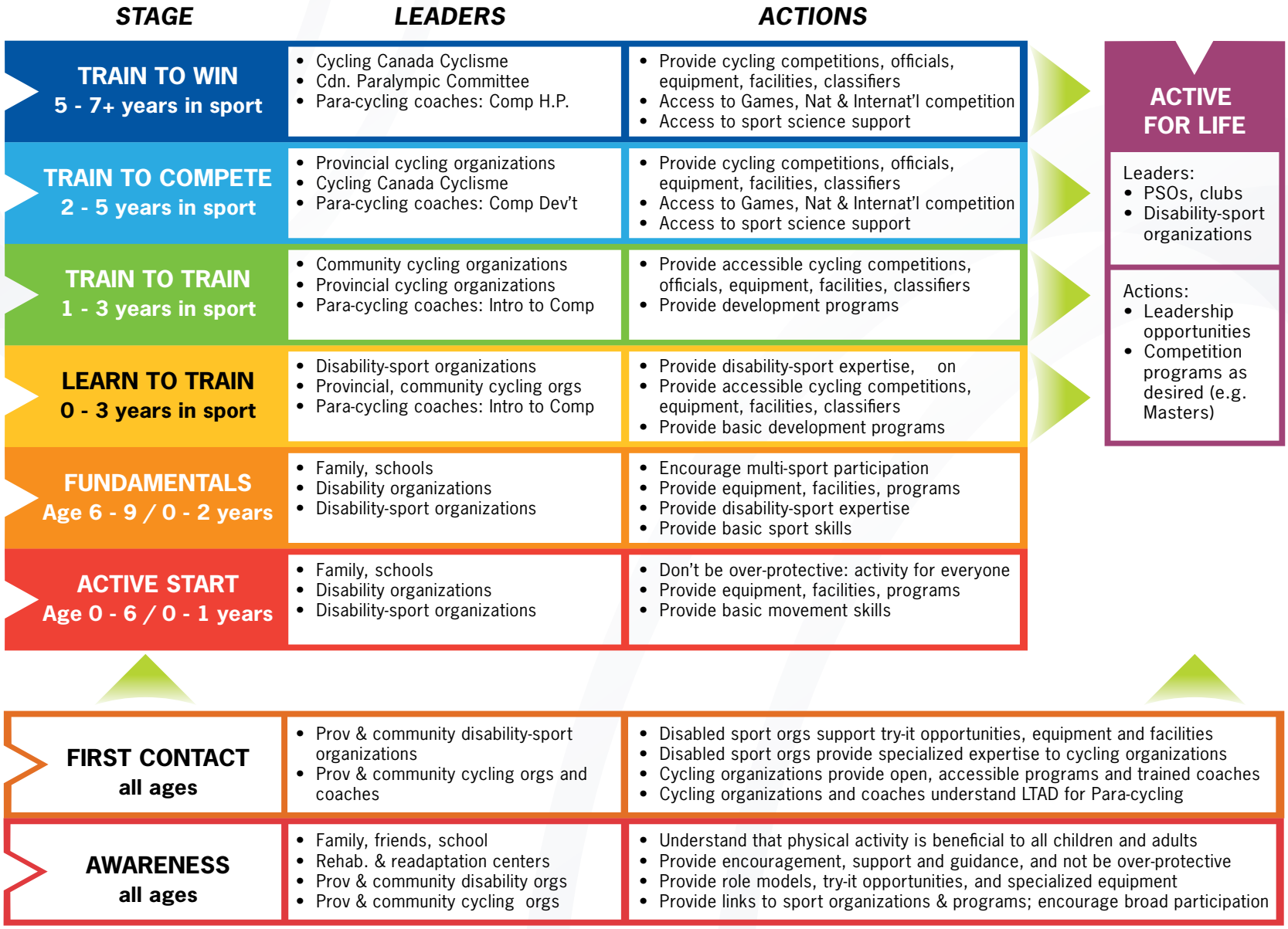


Diagram: Success Factors for Para-cycling Development

5 – Conclusion

Para-cycling presents an exciting opportunity to Canadian cycling. While the numbers of athletes with a physical impairment are small and obstacles such as limited equipment, facilities, expert coaching and opportunities to compete can be significant, the results attained by Canada's Para-cyclists are inspirational. By making Para-cycling a key part of our coach and athlete development programs from the start, we can introduce more athletes with an impairment to cycling and help them attain their dreams.

The Canadian Cycling LTAD model, with the addition of Awareness and First Contact stages, is a useful guide to the future development of Para-cycling. It provides additional information to support Para-cycling athletes, coaches, sport leaders and parents. Using the LTAD framework we can make Para-cycling a stronger sport, one in which more Canadians participate life-long and in which more talented athletes reach the podium in international competition. Every member of the cycling community has a role in supporting the Para-cycling system, whether through awareness, indirect support or direct action and leadership. A key to future success will be enhanced cooperation between all members of the cycling, sport and disability-sport community.

This document is only a first step. Our goal is to give Canada's Para-cyclists opportunities and choice: to strive to stand on top of the podium, or simply to be active for life in our sport. Working together, we can reach our goal.

Let's go!

Resources and Contacts

In addition to the resources and contacts listed here, useful Para-cycling information can be found at www.cyclingcanada.ca

Resources

Cycling Canada Long-Term Athlete Development, Volume 1. 2008. Cycling Canada, Ottawa, ON. ISBN 978-0-9809082-0-6

Canadian Sport for Life, 2005. Balyi, I., Cardinal, C., Higgs, C., Norris, S., and Way, R. Canadian Sport Centres, Vancouver, BC. ISBN 0-9738274-0-8

Coaching Athletes with a Disability, 2005. Coaching Association of Canada, Ottawa ON.

No Accidental Champions, 2006. Balyi, I., Cardinal, C., Higgs, C., Norris, S., and Way, R. Canadian Sport Centres, Vancouver, BC. ISBN 0-9738274-3-2

Programme de soutien au développement de l'excellence (PSDE) 2009-2013. 2009. Fédération québécoise des sports cyclists, Montreal, QC

Contacts

There are many organizations serving athletes with a physical impairment. Most provincial cycling associations have designated a contact person for Para-cycling. In addition National Disability-Sport Organizations can direct inquiries to affiliated organizations in the provinces/territories.

Provincial Cycling Associations

Cycling British Columbia
#201-210 West Broadway
Vancouver, BC V5Y 3W2
Direct: 604 737-3164
www.cyclingbc.net

Alberta Bicycle Association
Percy Page Centre,
11759 Groat Road,
Edmonton, AB T5M 3K6
780 427-6352 (B)
www.albertabicycle.ab.ca

Saskatchewan Cycling Association
2205 Victoria Avenue,
Regina, Saskatchewan S4P 0S4
306 780-9299 (B)
www.saskcycling.ca

Manitoba Cycling Association
200 Main Street, Suite 309,
Winnipeg, Manitoba R3C 4M2
204 925-5686 (B)
www.cycling.mb.ca

Ontario Cycling Association
307-3 Concord Gate Toronto,
Ontario M3C 3N7
416 426-7243 (B)
www.ontariocycling.org

Fédération Québécoise des sports cyclistes
4545 Pierre de Coubertin
Montréal, Québec H1V 3R2
514 252-3071 (B)
www.fqsc.net

Vélo New Brunswick
P.O. Box 3145 Fredericton,
New Brunswick E3A 5G9
506 877-7809 (B)
www.velo.nb.ca

Atlantic Cycling Center
200 Prom. Du Parc,
Dieppe, NB E1A 7Z3
Contact: Luc Arseneau

Bicycle Nova Scotia
5516 Spring Garden Rd, 4th Floor,
Halifax, Nova Scotia B3J 1G6
902 425-5454 x 316 (B)
www.bicycle.ns.ca

Bicycle Newfoundland and Labrador
P.O. Box 2127, Station C,
St. John's, Newfoundland A1B 4R3
709 738-8889 (B)
www.bnl.nf.ca

Cycling Association of Yukon
9B Diamond Way,
Whitehorse, Yukon Y1A 6G4
867 667-8212 (B)

Cycling PEI
P.O. Box 302
Charlottetown, PEI C1A 7K7
1800 247-6712
www.sportpei.pe.ca

National Disability-Sport Organizations

Canadian Blind Sport Association
5055 Joyce St, Suite 325,
Vancouver, BC, V5R 6B2
Tel: (604) 419-0480,
Fax: (604) 419-0481
www.canadianblindsports.ca

Canadian Cerebral Palsy Sports Association
1376 Bank Street, Suite 325,
Ottawa, ON, K1H 7Y3
Tel: (613) 748-1430,
Fax: (613) 748-1355
www.ccpsa.ca

Canadian Wheelchair Sports Association
2255 St. Laurent Blvd., Suite 108,
Ottawa, ON, K1G 4K3
Tel: (613) 523-0004,
Fax: (613) 523-0149
www.cwsa.ca

Canadian Paralympic Committee
225 Metcalfe Street, Suite 310
Ottawa, ON K2P 1P9
Tel: 613-569-4333
Fax: 613-569-2777

CyclingCANADACyclisme

203 - 2197 Riverside Drive
Ottawa, Ontario K1H 7X3

Tel: (613) 248-1353
Fax: (613) 248-9311

www.cyclingcanada.ca